Remarks
ON
THE MEDICAL LIBRARY IN POST-GRADUATE WORK.*

BY
WILLIAM OSLER, M.D., F.R.S.,
PRESIDENT OF THE MEDICAL LIBRARY ASSOCIATION.

With collectivism the order of the day it is very natural that those interested should associate themselves in an organization which has for its object the welfare of the Medical Library. As stated in the circular, the Provisional Committee has given the new society a wide basis. The objects are:

(*a*) To bring together those engaged in or interested in medical libraries and medical literature, and for the discussion of matters associated with their fostering and care;
(*b*) To maintain an exchange for the distribution of duplicate books and periodicals;
(*c*) To increase the facilities for reference work;
(*d*) To encourage the study of the history of medicine;
(*e*) To issue publications dealing with medical library work;
(*f*) To form a library union amongst those of the medical libraries between which the exchange of books can be arranged—

all unexceptionable objects, and with the additional merit of being within reach of accomplishment.

Let me say at the outset that this is not to be simply a society for those whose work is more or less officially concerned with libraries, but it is for all interested in the book as a living factor in the education of the members of a learned and consequently of a very bookish profession. Whether the British doctor has been a better book-lover or book-maker is an open question, but from the first Oxford movements in the thirteenth and in the early fifteenth centuries we find him ever in the ranks of the keenest bibliophiles. He has never been a great student of the book as such, and it is strange not to find in the long line of splendid bibliographers, from the lovable Conrad Gesner to the encyclopaedic Billings, an Englishman of the first rank. I do not forget the useful books of Douglas, of Young, and of Forbes, nor the Rabelaisian (in the mirth-loving sense) two-letter bibliography of Atkinson †; but they are feeble efforts in comparison with the works of our foreign and American brethren. But the Englishman has made up by being a great book-lover. Some of the best known of collections have been made in this country by physicians. It would be impossible to parallel elsewhere the libraries of Mead, Askew, and William Hunter. The sale catalogues of the former tell of treasures (and of prices) that send a thrill of regret through the book-lover that his lot was not cast in those happy days. The William Hunter Library met a better fate, and in the University of Glasgow is an enduring and worthy monument to the elder of the two great brothers, so unlike in mind and manners, so like in the capacity to see the true value of collections. It is to be hoped that a complete catalogue of this library may be issued before long, in companion volumes to the splendid catalogue of the manuscripts recently edited as a memorial to the late Professor Young.

It is safe to say that in proportion to population there are more medical libraries in these islands than in any other country in the world. We hope before long to have a proper census of them, and meanwhile I base the statement on casual observation. One of the first questions I ask on visiting a new town is, "Where is your medical library?" and I have been astonished at their extent and value. Usually in connexion with the county hospital or the medical society, or both, many of them go back to the middle or later part of the eighteenth century, and bear witness to the culture and intelligence of the provincial physicians of those days.

There are three groups:

First, in the national libraries of the capitals and of the universities, such as the British Museum and the Bodleian, are large collections of medical books—that of the British Museum the largest in the country. Upon these public storehouses of bibliographical knowledge we all draw freely. In many of the small libraries there are special collections of great intrinsic or historical value. The college libraries of Oxford and Cambridge contain manuscripts and old books of exceptional interest. Diel's topographical catalogue shows how rich some of the colleges are in the Greek medical manuscripts, particularly Balliol, New, Merton, All Souls, and Caius. Stowed away on their shelves are many fine folios, the gift of old members. Gulston's books are at Merton; New College has a very choice collection, including some of Walter Bayley; Floyer's books are at Queen's, Paddy's at St. John's, Coggan's at Oriel—indeed there is scarcely a college library without interesting medical associations.

Secondly, the medical libraries proper, among which those of the Royal Colleges of the three capitals are the most important. Easily first in extent and in the wide sphere of its influence is that of the Royal College of Surgeons of England, which is a model of good management. The library of the Royal Society of Medicine is the largest, I believe, connected with any medical society, and with the new organization is rapidly growing. The libraries of the Faculty of Physicians and Surgeons of Glasgow, of the Medical Institution of Liverpool, of the Birmingham Institute, of University College, Bristol, the Worth Library of the Steevens Hospital, and the Manchester Medical Society, form collections of the first rank. One of the most valuable of professional libraries is that of the British Medical Association, under whose auspices, so to speak, we meet to-day. Founded in 1889, it now possesses more than 20,000 volumes, with a card catalogue. The books are chiefly modern, with a large proportion of monographs and valuable sets of foreign periodicals. It receives also, and this is a very important point for borrowers, the theses of the French universities. Through it the Association has already done good work by aiding in the formation of local libraries, and between 6,000 and 7,000 duplicates have already been distributed. An important step has recently been taken to make this a lending library for members of the Association, who will be able to borrow expensive works and periodicals such as are only occasionally required for consultation. Having frequently visited the library in the old building, I very gladly bear testimony to its usefulness and to the admirable way in which it is managed by the librarian, Mr. Honeyman. I am not surprised to hear that the annual number of readers is very large, more than 6,000 in 1906. In the new building the arrangements are excellent, and I have no doubt that provincial members visiting London will more and more resort to this library. In all matters of management and detail these large libraries will be able to guide and assist us with their experience. Certainly we shall get much more from them than they from us, but theirs will be the richer blessing of the giver. With a well-managed exchange we may be able to help them fill the lacunae on their shelves, and it should be our aim to make these national collections more and more complete.

By far the best work we can do is in the organization, preservation and extension of the smaller libraries already existing in the provincial cities and towns. Many of these are already well housed and well arranged, as for example the Reading, York and Norwich libraries, to speak of those which I know personally. There are scores of hospitals with good collections, some of the greatest value, as those of Exeter and Bath and the Brackenbury Library, Preston. Some of them have associations of exceptional interest. I have always been an admirer of Caleb Hillier Parry of Bath, type of the old naturalist-physician, more common a few generations ago than now. His library in the Royal Hospital remains a fitting monument to a scholarly man of wide sympathies, and who left a deep impression on that part of the West Country which has given us such men as Jenner, Pritchard and Symonds. In those days life was not so full, and competition was less keen, so that men had more time to read and to think. Many of the best of these smaller libraries date from the latter part of the eighteenth century and the

* Delivered at the inaugural meeting of the Medical Library Association, held at Belfast, July 28th, 1909.

† The only man, so far as I know, who has had the courage to write a diverting bibliography, but unfortunately he only got through A and B.

beginning of the nineteenth century. Some of them have died into cupboards and barrels, and sadly need the kind care of a Philip de Bury, one of the founders of Oxford libraries, who, in the fourteenth century, complained bitterly that he found precious volumes defiled and injured by mice, worms and moths. A collection of this sort, offered me a few years ago, I was able to buy through a friend, for the Johns Hopkins Medical School. It had associations with Joseph Priestley, with John Aikin, Thomas Percival and James Kendrick, well-known names in the North. As illustrating how valuable may be some of these out-of-the-way collections, there were in this one scores of seventeenth and eighteenth century pamphlets which were not in the London libraries.

Our best work will be in stimulating an interest in these smaller libraries, either in connexion with the medical society or with the hospital, and in helping to organize them; and from every one of them we hope to have in our society a representative.

And, lastly, there is the private library of the practitioner, the scope of which will depend on his training, his tastes, and his purse; and this brings me to the subject of my remarks, "the value of the library in post-graduate study."

Some of the best of men have used books the least, and there is good authority for the statement that shallowness of mind may go with much book-learning. Descartes, one of the most brilliant of thinkers and observers, had no library. At Egmond, asked by a friend the books he most read and valued, he took him into his dissecting room and showed him a calf—"There is my library." An identical anecdote is told of John Hunter. But these were exceptional men; and few will be found to doubt the importance of books as a means to what the same author called the end of all study—the capacity to make a good judgement.

It cannot be denied that many men practise, and do so successfully, with few journals and still fewer books. Radcliffe, whose memory is enshrined in two of the finest library buildings in the kingdom, and whose travelling Fellows are supposed to have at least a triennial thirst for new knowledge, neither read nor wrote books; and he is credited with the famous *mot* that he could set down the whole art of medicine on a sheet of paper. But conditions have changed, and medicine is now a rapidly progressive science, as well as an exceedingly complicated art, of which, at qualification, a man has only laid the foundation; and if he is to develop his intelligence—that is, get an education—it must be by systematic post-graduate study. Out of leading-strings he must himself be at once teacher and pupil, and make and keep certain self-made laws. Whether he will get this education, whether, indeed, he will be able to keep what he has, will depend in part upon the sort of training he has received, and in part upon the type of mind with which he has been endowed. Unless as a student he has got that "relish of knowledge" of which Locke speaks; unless he has got far enough to have his senses well trained to make accurate observations; unless he has been taught how to use his intelligence so as to form a good judgement, the teacher will have more or less of a fool for a pupil, and between them make a sad mess of an education. After a few years such a man gives up in despair, and without mental exercise grows stale and is fit to do only the ordinary reflex practice, in which cough means an expectorant mixture, and heart disease digitalis, just as surely as a tap on the patellar tendon brings out the knee-jerk. A glance at the consulting-room suffices for the diagnosis of this type: the BRITISH MEDICAL JOURNAL or *Lancet* lies uncut in heaps on the table, and not a book is in sight! Some of the men of this type play a good game of tennis, others shoot and ride well, more play a good game of bridge, but they are lost souls, usually very dissatisfied with the profession—the kickers, the knockers, the grumblers, without a glimmer of consciousness that the fault is in themselves.

Post-graduate study is a habit of mind only to be acquired, as are other habits, in the slow repetition of the practice of looking at everything with an inquiring spirit. A patient with pneumonia has grass-green sputum. "Have I ever seen it before? Have I a note of it? Where can I get a good description of it? What does it signify?" These are questions preliminary to getting a bit of clinical education, trifling in itself apparently, but when stored up and correlated with other facts may become the basis for an intelligent judgement on an important case.

There are many factors in this training—note-taking, reading, the medical society, and the quinquennial brain-dusting at a hospital or a post-graduate school. But I am only here concerned with one—books. I would like to speak of the value of notes, however brief, collected through long years as the sole means whereby a man gets his experience codified and really helpful; but I cannot wander to-day from the book, in which I include the JOURNAL.

But how can a busy man read, driven early and late, tired out and worried? He cannot. It is useless to try, unless he has got into the habit when he was not so busy; then it comes easy enough, and the hardest-worked man in the land may read his journals every week, even if he has to do it in his carriage. My old teacher and colleague at McGill, Palmer Howard, was the busiest practitioner in Montreal, but the weeklies and the monthlies, English and French, the good old Quarterly, the hospital reports, the new monographs—nothing escaped him, and I have often heard him say that he did his best reading as he drove from patient to patient.

It is not so much a question of *when* but of *what* and of *how*. What sort of reading will best help a man in his education, will help him to keep up with the times and to develop into a thinking, reasoning practitioner? Let him get rid of the notion that much has to be read; one or two journals, a good weekly—the *Lancet* or the BRITISH MEDICAL JOURNAL—a good monthly—the *Practitioner* or the *American Journal of the Medical Sciences*—suffice; but let them be read thoroughly. Then each week strip the husk of advertising sheets, and keep on the desk a file of reasonable proportions, and to the articles which have been of interest refer again and again. At the end of the half-year bind your journals and insert slips where you have found articles bearing directly on your cases.

Carefully studied, a couple of journals are the very basis of post-graduate work, and year by year the files on the shelves become not simply the nucleus of, but actually a good working library, and, well marked in his mind, he has in them volumes on every special disease and a complete summary of the progress of medicine.

Let him follow the same practice with books. Buy with discrimination, and not too many, as here again it is a question of reading. If, as is said, the man of one book is dangerous, the man of a few books is more useful and more apt to keep the open, plastic mind. A good "System" of medicine and of surgery, an occasional monograph or work on special diseases, a new edition of a favourite textbook (when you can trust that it is really an editor's, not a publisher's, edition!), should suffice, and do not mean a large annual expenditure.

It is much simpler to buy books than to read them, and easier to read them than to absorb their contents. Too many men slip early out of the habit of studious reading, and yet this is essential to a man if he is to get an education. To be worth anything it must be associated with concentration—with that mental application which means real effort. Of the new Allbutt and Rolleston "System" I can read comfortably about twenty pages in an hour—sometimes of a tough author not more than fifteen. Half an hour a day would finish the six volumes already published within a year.

More than once I have referred to the three essentials in the house of the general practitioner—the library, the laboratory, and the nursery—and of these the first is much the easiest to get, as he starts with a nucleus in his students' textbooks. Effort and system gradually train a man's capacity to read intelligently and profitably, but only while the green years are on his head is the habit to be acquired, and in a desultory life, without fixed hours, and with his time at the beck and call of everybody, a man needs a good deal of reserve and determination to maintain it. Once the machinery is started, the effort is not felt in the keen interest in a subject. As Aristotle remarks, "In the case of our habits we are only masters of the beginning, their growth by gradual stages being imperceptible, like the growth of a disease"; and so it is with this habit of reading, of which you are only master at the beginning—once acquired, you are its slave.

So far as the library is a factor, the greater part of a man's post-graduate education must be at home. In this

country no man practises very far from a county town in which there is a medical society or a general hospital with a library attached. A notebook for special points to look up, or for certain books of reference, will get him into the habit of frequenting it, and he should become a subscriber, as in this way not only does the library widen its influence, but finds means for its support. The county library, wherever situated, should be the much-esteemed consultant of the general practitioner.

But it is in the towns of 20,000 in population and upwards that the library is of the greatest value, and where it becomes a factor of the first importance in the development of the progressive man. These are days of great opportunities, when we have discovered other ways to the top, toilsome all the same, than up the old rungs of the academic ladder, or the weary climb of the stairs of a London hospital. We are waking up to the fact that the man may make his own environment, and may make it just what and where he pleases; he may even perform a miracle—the mountain may come to Mahomet. Let me give you a notable illustration.

A few years ago when two young Irish-Americans called Mayo began to frequent the surgical clinics of Europe, no one knew where they came from; no one had ever heard of Rochester, Minnesota, and when informed that it was on the "Prairies," about 1,000 miles north-west of Chicago, there was a shrug of the shoulders and "Oh!" Self education, post-graduate study, books, journals, laboratory work, have enabled these remarkable men to build up one of the largest and in some respects the most important surgical clinic in the world, and a town of less than 20,000 inhabitants has become the Mecca of all surgeons.

To the man who is ambitious to use his opportunities in a town or city, a well selected library is essential, and whether he be surgeon, physician, or specialist, he needs as a rule more than his own shelves supply, often indeed a good deal more than the library can offer. As I have already stated, the library of the British Medical Association is offering great facilities to its members. In England, too, he can and should join the Royal Medical Society, from which monographs and special journals may be had, but he cannot always wait, and there is no reason why in the larger towns there should not be a library which ministers to the ordinary wants of all ranks. The journals at once become a serious consideration—French, German, and American—but a few of the best suffice when supplemented by the admirable German *Centralblätte*. By means of an exchange this association can render great assistance, while in the thickly populated districts a system of exchanges between libraries would cut in half the cost of the more expensive journals. In this matter, too, a central library like that of the British Medical Association may be most helpful.

In large cities the profession should have its own home in connexion with the leading medical society, and of such an organization the library forms an important part. Belfast has set a good example, and through the munificence of Sir William Whitla you have a splendid building for the Medical Institute. About such rooms or buildings should centre the life of the profession, present and past. Portraits of the old worthies, memorials of friends, and to our heroes (such as the beautiful stained-glass window in the Institute here to Dr. William Smyth), show-cases full of the interesting relics of the profession, with manuscripts and books illustrative of local history—all these memorials make the past live again. At York you may see in the medical library the actual forceps with which Dr. Slop broke the bridge of Tristram Shandy's nose, and in every county there are relics of the profession well worth preserving.

It should be the ambition of the men in each county to have well-equipped rooms, such as those I have visited with much pleasure at York and Norwich. If, as at Reading, Exeter, Preston, and Dublin (Steevens' Hospital), rooms have been furnished in the hospital, see that the equipment is attractive; many libraries have deservedly fallen into disuse because men will not seek books or journals in dull, dark, cold, dusty, uninviting rooms.

Like everything else that is worth having, a library costs money. Do not try to do too much, strive to have a large membership, which enables the fees to be low; and when the library is in connexion with a hospital, the current English journals should be furnished by the governors to the staff. In towns with a tax for the upkeep of a public library, a grant should be made for the medical library. But the financial and other questions of organization and support will be discussed, I hope, at an early meeting.

Were there time I should like to say a few words on the subject of *how* to read, but the essence of the whole matter I found the other day in the Bibliotheca Lancisiana, Rome (founded in 1711, and containing the books of the famous Lancisi). In the opening address, 1714, *De recto usu Bibliothecae*, the Abbé Carsughi discusses the subject in three sections, and gives some good rules. The first section, *Librorum scilicet delectum*, need not detain us, but in the second, *Legendi methodum*, he urges two important points—to read in a certain order and with a definite object, and *lente festinans*, "unhasting but unresting." In the third section, *Adnotandi modum*, he urges the necessity of careful note-taking, quoting the praise of Clement of Alexandria, "Oblivionis medicamentum, monumentum senectutis et adjumentum memoriae." He dwells upon the importance of study in the morning, which was all very well in those days, but is not one hour after six in the evening worth now two before eight in the morning? (I am sure it is to me!) With half an hour's reading in bed every night as a steady practice, the busiest man can get a fair education before the plasma sets in the perigangliomic spaces of his grey cortex.

But there is another side of the question of books and libraries—man does not live by bread alone, and while getting his medical education and making his calling and election sure by hard work, the young doctor should look about early for an avocation, a pastime, that will take him away from patients, pills and potions. One of the best features I find in my "old country" colleagues is the frequency with which they have hobbies. No man is really happy or safe without one, and it makes precious little difference what the outside interest may be—botany, beetles or butterflies, roses, tulips or irises, fishing, mountaineering or antiquities—anything will do so long as he straddles a hobby and rides it hard. I would like to make a plea for the book, for the pleasant paths of bibliography, in which many of us stray to our great delight. Upon this how charming is old Burton (really one of us, "by profession a divine, by inclination a physician," he says), whose *Anatomy of Melancholy* is the only great medical work ever written by a layman. "For what a world of books offers itself, in all subjects, arts, and sciences, to the sweet content and capacity of the reader! In arithmetic, geometry, perspective, optics, astronomy, architecture, sculpture, painting, of which so many and such elaborate treatises are written; in mechanics and their mysteries, military matters, navigation, riding of horses, fencing, swimming, gardening, planting, great tomes of husbandry, cookery, falconry, hunting, fishing, fowling, etc., with exquisite pictures of all sports, games, and what not! In music, metaphysics, natural and moral philosophy, philology, in policy, heraldry, genealogy, chronology, etc., they afford great tomes, or those studies of antiquity, etc, *et quid subtilius Arithmeticis inventionibus, quid jucundius Musicis rationibus, quid divinius Astronomicis, quid rectius Geometricis demonstrationibus!* What so sure, what so pleasant?"

Our society will, I am sure, be very helpful to men who take up this study. We hope to have two groups, mutually helpful—the professional bibliographers, the men in charge of our libraries, who have to do with the book, as such, and who care little or nothing about its contents; and amateurs, like myself. As Professor Ferguson says in his charming essay[1]:

> He (the bibliographer) has to do with editions and their peculiarities, with places, printers, and dates, with types and illustrations, with sizes and collation, with binding and owners, with classifications, collections and catalogues.

There are scores of book collectors whose hobby also takes them in this direction, but we should have a large amateur group who will be happier in following other lines. Personally, I collect on two principles—first, interest in an author, which is a good guide, as the book illustrates the biography, a principle which has the advantage of helping at least to keep you within the limits of purse and shelves, more the latter than the former. Take, for example, the two small groups of books I have placed

in our exhibition, the one illustrating Servetus, the other Ulrich von Hutten. Valuable as they are from the standpoint of the professional bibliographer, this is nothing to the interest awakened in the men themselves, in their aspirations, their labour, and their tragic fates. For the amateur this personal note clothes the dry bones of bibliography and makes them live. And my other principle is this: a student of the history of medicine, I look out for books which have left their impress on it in some special way. If one is particular to examine carefully into the claims of a book before admitting it to the select company on your shelves, you here again cultivate a due regard for purse and space. For example, five or six books illustrate the whole subject of auscultation and percussion, only the masterpieces are chosen. I confess there may be a certain satisfaction in tracing out the biography of a book, but it is cold work unless you love the author.

Judiciously cultivated, bibliography has many advantages as a pastime for the doctor; a little patient care, a very small expenditure of money, and a constant look-out for the books wanted are the essential requisites. Nor is there ever any difficulty in the choice of a subject—anything he may be interested in has its bibliographical side. One friend (Dr. Turrell), a very busy man, is a keen fisherman, and has found the time to collect a library on this subject, and has written the article on it for the *County History of Oxfordshire*. Another man has kept up his classics, and collected everything relating to Horace. Another has a library relating to the order of St. John. Another friend in large general practice has found time to make a collection of the masterpieces of English literature, which has not only been a diversion and an education, as it has brought him into the best company of the past four centuries, but he tells us there is another side—it has been a better investment than life insurance. A member of our profession, the late Professor Corfield, made one of the best modern collections of bindings, the sale of which at Sotheby's in 1904 was one of the bibliographical features of the year. Once in a subject it is extraordinary how it grows and develops. As Atkinson says, "It is an art of itself, which is not easily sought into or acquired, but which, if so acquired, may stand both his pleasure and profit in very great stead in a very long or a short life." And the busiest general practitioner may find the time for first-class work. Many of you may have seen a book issued two years ago from the Oxford Press on Greek and Roman medical and surgical instruments, the only separate treatise on the subject which has appeared in English. It illustrates the hobby of a very hard-worked practitioner in the town of Hartlepool—John Milne, whose spare time and whose vacation have been spent in studying this aspect of Greek and Roman archaeology.

We shall hope to have in our society both the professional and the amateur—the man whose life-work is in libraries, and those of us who are fond of books, either from a biographical or a bibliographical standpoint. We should be able to encourage library organization, and once established as a common meeting ground for all interested, the society should be of great value to the profession. We look for a large membership, and many will join who do not belong to either of the above-mentioned groups, the men who feel that, as a matter of policy, such a society should be supported. *Non sibi sed toti*—let us work in the spirit of this motto, and our future is assured.

In starting an organization of this sort the work always falls on one or two men. We have to thank Dr. Stanley Hall, of Bristol, and Mr. C. E. A. Clayton, of the Manchester Medical Library, to whom is due entirely the success of this preliminary meeting. We have also to thank the university authorities for allowing us to meet here, and furnishing us with rooms for the exhibit.

REFERENCE.

[1] *Some Aspects of Bibliography*, Edinburgh, 1900.

UNDER the will of the late Rev. Edward Llewellyn Adams, a Congregational minister of Scarborough, sums of £4,000 are bequeathed to Manchester Royal Infirmary and the Scarborough Hospital, for the endowment of wards to be called the Elizabeth Adams Ward and the Sophia Adams Ward respectively. A sum of £500 is also left to the Smedley Memorial Hydropathic Hospital at Matlock.

A PLEA FOR A MORE LIVING PATHOLOGY.

By HARRINGTON SAINSBURY, M.D., F.R.C.P.,

SENIOR PHYSICIAN, ROYAL FREE HOSPITAL.

IT is universally acknowledged that a diligent frequenting of the *post-mortem* room, supplemented by a careful study of the shelves of its annexe, the pathological museum, is essential to the education of the student of medicine and surgery. Admittedly it is not possible in any other way to gain that fuller insight into the problems set by disease, without which that fuller solution of these same problems, the final objective of the art of Hippocrates, must wait. Yet even now, in this twentieth century, after so much earnest labour and such an abundant ingathering, it is questionable whether we do look at the subject, pathology, from the right point of view; whether we utilize to their fullest the treasures of the dead-house and museum.

In the remarks which follow, those pathological changes which are discernible by the naked eye will have chief consideration, but the remarks are applicable to all changes in whatever scale of magnitude they present themselves.

Do we, then, look at the subject from the right point of view? The question is fundamental, but to its answering another question must be put—namely, What is the object of the *sectio cadaveris?* The reply seems obvious enough—the cause of death. But death is a negative quantity, and the search after negatives is apt to be unfruitful; moreover, the ultimate objective being the healing art, it is not apparent what bearing negative quantities can have upon this art—what appeal, that is, the *materia medica vel chirurgica* can make to this variety of nothingness. Can we define death more positively? Yes, death is the cessation of life; and, substituting this definition, the object of our search now becomes the cause of the cessation of life. Ah, that is more illuminating. We wish, then, to know why life tripped here, stumbled there, now slackened its pace and *rallentando* came gradually to a halt. Is this a real difference, or is it only a matter of words? It is a real difference in the *point of view;* for, whereas in the former case we looked at death, now we look at life. Let us, therefore, enter the *post-mortem* room or the pathological museum, looking at life and seeing not inanimate structures, not pictures of still life, but the instruments, more or less faulty, of life, the impediments, more or less obstructive, to life. Let us endeavour to conjure back the vital spirits, and see these in active play, within the organs and tissues, up to the moment when the play ceased.

The ordinary procedure of the pathologist is to seek out the spoiled organ or organs, and having found, to set apart in some suitable fixative, fixing so rigidly that it becomes a difficulty to conceive how these tissues ever moved; the epitaph follows in due course: *obiit*, he died, for reasons plain to view; note the want of proper gland tissue here, the structural disturbance there. The comment of the intelligent reader of epitaph and specimen is inevitable: What, in the face of this disintegration, could any self-respecting man do, one priding himself upon being *integer vitae*—what else but die?

Is, then, the method of the pathologist wrong? No, so far as it goes it is all right even to the fixative; the fault is that it does not go far enough; it stops short just at the point of real interest. The method would show abundantly why the man *is* not, but just why he *was*, a few moments, hours, days, before his tissues put off vitality, that is not apparent; yet that is the one thing which interested himself and his family before *dies illa funesta*. In commenting thus we are not alluding to such major catastrophes as a massive aneurysmal rupture, or a smaller haemorrhage at a point of vantage, as in the medulla oblongata, or an embolism of the trunk of the pulmonary artery—in cases such as these the reason of the event is seen at a glance; but to those deaths, more or less gradual, which reveal to naked eye as well as to microscope changes we are wont to regard as essentially chronic in their development—for example, fibroid, fatty, caseous, or calcific changes. If these are the causes of death, then, as they have gradually amassed themselves by increments which from day to day must have been imperceptible, a summation of infinitesimals, should not life have dwindled in the same propor-

tion and have disappeared by an insensible efflux? But do these cases die like that? Is not life often at full swing in semblance up to within six months, a month, a week, twenty-four hours of death? True it is always possible to escape from this predicament and to take refuge behind the toxin, since nowadays we are barely permitted to live, much less die, without it; but, if a toxin is the cause of death, then it must be allowed that the specimen before us is not illustrative, since it is silent concerning it.

Clearly we must approach the problem from another point of view, and seek to discover how the man lived in spite of the obstacles which the specimen exhibits; how vitality triumphed over the want of gland tissue here, the structural disintegration there, *until* the resistances grew to such a height that the vital spark could no longer overleap the interval and complete the circuit—the round of life.

The formula of Life may be thus expressed:

$$\text{Momentum} \overrightarrow{>} \text{Resistance},$$

"Momentum" standing for the sum total of the living momenta of the several parts of the body, organs, and tissues; "Resistance" for the sum total of the inertias and resistances within and without the body, in opposition to the momentum. The formula shows that life *is* when momentum preponderates over resistance.

The formula of Death, similarly expressed, shows us:

$$\text{Momentum} \overleftarrow{<} \text{Resistance}.$$

Resistance now preponderates, the sign is reversed, and life as a particular kind of momentum ceases.

Now, if an organ die in part, for instance, a liver or kidney become cirrhotic—and it is a partial death when a tissue of a lower functional order replaces the proper secreting cells of a gland—then the new fibroid elements may be said to add themselves to the internal resistances of the body. The vascular system affords the best illustration of this statement, for if we suppose the branchings of the arterial tree to become cirrhotic upon a large scale, then the momentum of the circulating blood, into which the ventricular contraction has been converted, will meet with an additional resistance, and forthwith death threatens, nearly or remotely, according as the reserve of ventricular contractility is small or large—according, that is, as the powers of cardiac compensation are small or great.

In the past it has been customary to look at the resistance side of the formula to the exclusion of the active, momentum, side, and for this reason the pathologist has tended to become the sceptic. Busy with the obstacles to living, he has overlooked the fact that life did obtain; confronted with the spoiled organ he has been apt to exclaim, "But what could you or I have done? What appeal was possible to that fibrosis, that calcification?" He is wrong, in the first instance, from his own point of view, for if we are to credit modern teachings, even fibrous tissue can be appealed to. The use of fibrolysin may be given in illustration, and though this drug should disappoint us in the extent of its serviceability, yet it opens the door to possibilities along this line of approach. He is doubly wrong in that he ignores the appeal to all those living tissues which a little reflection will assure him have been in triumphant operation for so long.

At the *post-mortem* examination, therefore, at the same time that the obstacles to life are being demonstrated—nor can this be done too forcibly—let the student's attention be directed in the next instance to the fact of life, hitherto, against such odds; then, if possible, let the compensatory reactions which the obstacles have called forth be made evident: here will come the hypertrophies, the vicarious workings of functionally allied parts, the anastomotic adjustments and so forth. Thus, having shown where the system is unsound, let it be shown next where it is sound, since it is upon the last named, the sound elements, that we shall have to lean in practice.

In pursuance of this method let us first examine the spoiled organ, and, having carefully inspected the morbid elements—fibrous, fatty, amyloid—and in these elements seen encumbrances only to function, let us next inquire in how far these changes did actually spoil the working of the organ. To that end let us obtain the living data secured in the wards. We shall then learn that this fibrous kidney, for instance, was secreting so many ounces of urine, of such a specific gravity and holding in solution such-and-such ingredients; that this fatty heart was maintaining such-and-such a blood pressure, was driving the blood through its circuit with or without evidence of stases or capillary oozings (oedemas)—in fact, was circulating it more or less satisfactorily; that, so far as could be judged, this amyloid liver was, functionally, surprisingly little impaired by the pronounced degeneration. In this way we shall discover to what extent the damaged organ has preserved its functional capacity, shall determine (to borrow of the physicists) its functional coefficient, and shall have to admit, without any question, that the naked-eye and microscopic appearances are insufficient criteria of functional capacity, and that the working powers of the spoiled organ are often far in excess of that which these appearances would have led us to expect. The conclusion to be drawn will be that the spoiled organ may still be appealed to therapeutically; nay, that it must be so appealed to if we would do our best for the patient, since it is our clear duty to make call upon all the available powers of the system. Experiment alone can determine the limits of this power of appeal, which must be gauged by a cautious advance.

The first reform to be advocated is, therefore, that each specimen exhibiting the spoiled organ shall be so labelled as to set forth, as briefly as clearness will permit, the functional coefficient of the organ, that is, the amount of life it possessed. There will be revelations in store for us little short of marvellous when in this way we come to look at the residual vitalities of damaged tissues: before our eyes these dead structures will become living mechanisms in active movement.

In the next place we shall endeavour, both in *post-mortem* room and museum, to demonstrate the interaction of living parts. I have already touched upon this subject, but inadequately. In order to do this we must associate as many parts as are concerned in the interaction to be shown. Let us take, for example, a case of chronic Bright's disease of the fibroid type. We shall now bring together first the fibroid kidney and the sclerosed artery as exemplifying either a primary concomitance or sequence; next we shall add to the preparation the hypertrophied left ventricle, which the widespread vascular degeneration, as an added circulatory resistance, has called forth; and next we shall show in the same preparation the cerebral haemorrhage which has been the immediate cause of death, if possible exhibiting the degenerate artery which was unable to withstand the powerful contraction of the left ventricle. Such a specimen need not be of undue size, and certainly will not exceed the size of the preparations of anatomical dissections; its advantage will be obvious, it will be a lecture in itself, and whilst following its teachings we shall sit at the feet of that great physiologist and pathologist, Isaac Newton, and see his law of action and reaction in active operation.

Again, let us take the sequence of an embolism of a cerebral artery following upon a fungating endocarditis; or of an embolism of the pulmonary artery trunk in sequence to a phlebitic thrombosis; how much more telling the teaching becomes by the association in the same specimen of all the parts involved! Here will be comment sufficient upon *abiit, excessit, evasit, erupit.*

The toxaemias will not lend themselves exactly to this associative illustration unless the chemists will come forward and separate and crystallize the peccant matter, and even then the method will be by default rather. That, however, will be exactly its merit; for let us look again at the chronic fibroid kidney of Bright's disease in a case where death was not by cerebral haemorrhage but by uraemia, and consider the value of the preparation, showing on the one hand the damaged kidney, on the other a small tube containing in crystalline form the toxin. What an incentive to the student, when the examiners have ceased from troubling, to think a little over the problem and endeavour to link up in reasoned sequence these terminals—fibroid kidney and toxin.

The method, therefore, has the merit either of demonstrating a sequence or of showing a hiatus, of signalling a triumph or accentuating an ignorance. Its possibilities in the last-named direction admit of further development; thus the toxaemia does not always give rise to the same symptoms in the same class of disease—for example, the

granular contracted kidney may in one case be attended by symptoms of cerebral irritation (epileptiform convulsions); in another by symptoms of cerebral benumbing (coma); while in yet another case the incidence of the poison may be upon another system altogether, or produce symptoms in another system, as when an uncontrollable vomiting or diarrhoea is set up. It is possible that the chemist may discover different forms of toxin in these several cases, but it is possible also that one and the same poison may declare itself thus differently, according as it selects different parts of the mechanism to work upon—according, that is, as these parts happen to differ in their susceptibilities. Now, this difference in susceptibility may be an individual matter, and belong to the personal equation.

We witness the same kind of selective incidence when we observe a case of heart failure manifesting itself now as a general anasarca, and now, predominantly, as a portal area congestion. Why should an ischaemia—a physical shortcoming—select now this vascular area, and now that? Why, except the vessels in question happen to be less resistant, now here, now there.

Reverting to the fibroid kidney—the museum shelves will be well occupied by a series of specimens which, though to the naked eye and even to the microscope appearing to be replicas only of the same essential tissue changes, do actually illustrate different modes of death, different groups of symptoms. The labels will describe these symptomatic differences succinctly, and in this way will show the dynamic differences of *apparently* one type of tissue disturbance. The conclusion follows: either the tissue changes comprise differences yet to be discovered or we must go outside the organ for the complete pathology of the granular contracted kidney. In either case the specimens will have become dynamic in place of being static.

In the past the methods which have been practised in the collection and arrangement of museum specimens have recalled too much the methods of the postage-stamp collector; the bonds uniting the individual specimens have been of the slightest, whereas the unique specimen has figured all too prominently. The guiding principle, indeed, has been dissociative rather than associative, and in this association structure has received attention at the expense of function. It is imperative that these two be reunited, and that without ignoring the use of the unique specimen, the lessons to be learnt from the average or typical specimen be inculcated with more insistence. First let us learn all we can from types, then we can proceed to exceptions.

In yet another direction we would plead for a more living pathology. We come upon a fibroid state—say, an adhesion, a cicatrix, a diffuse sclerosis. What is its date? Is there anything about which we are more ignorant? Yet the reading of the case may depend in chief part upon the answer to the question. That fibrous tissue may develop very much more rapidly than we are wont to think; that we are apt to assign a chronicity often far in excess of the actual, is most probable; as it is also probable that the rate of formation is a very variable one, in different individuals and in different states of health in the same individual. The same is almost certain to hold for fatty and calcareous changes, though these—in particular the latter—are often held to indicate great age.* Whilst, therefore, we shall be prepared for wide variations, and to admit that in many cases it may be impossible to approximate to the actual rate of movement, what we do seriously need is a hither limit, the power of saying: "Well, that change cannot have taken place in less than such-and-such time."

To solve this question we have, of course, the observations upon the surface of the body during life, which the surgeon in particular can study; but to complete the study we need all the evidence we can obtain, from all sources, of the movement of disease during the time the patient has been under observation. Here is a case of extreme hob-nailed contraction of the liver; how long has it been in active development? The out-patient record is that on such-and-such a date the liver was found to be distinctly enlarged and tender. Again, here is a case of double cystic degeneration of the kidney in the adult, the left organ very large and very palpable in the wards; two years previously the patient was in the hospital, and, though a tumour could be felt on the right side in the kidney region, nothing could be felt on the left side. What is the rate of march of cystic disease of the kidneys in the adult? Evidence of this kind must give the answer.

In the case of tumour formation the question of primary and secondary is often of great difficulty, and anything which will mark symptomatically, or by physical sign, the site of development may be of primary import. A man is admitted into the wards some months after an operation for a growth of the testis; a large abdominal tumour is found along with crossed symptoms of pressure, namely, slight oedema of the *left* foot and leg, *plus* marked enlargement of the abdominal veins leading up from the *right* groin; death occurs, and there is found an enormous retroperitoneal mass completely compressing the left common iliac, whereas the right common iliac is only partially occluded. The examination of the partial blockage by clot on the right side suggests, however, an older mischief than the oedema symptoms on the left side, and the fact of the enlarged abdominal veins on the right side makes it certain that the tumour must have developed its pressure first on the right side. Of course, in this case the whole retroperitoneal mass was secondary, but the fact that by physical signs or symptoms it was possible to locate the march of the tumour formation teaches us that by like evidence we may in other cases be able to determine correctly the sites of the first and secondary stages of growth development.

Wherever it is possible, then, let the labels set forth the evidence of the line of march and rate of movement of the morbid process before us.

It would be easy to multiply instances in illustration of this subject, but no useful purpose would be served thereby, the cogency of the argument would not be enforced. In brief, then, the plea is that post-mortem room and museum shall be made to teach, as I have ventured to express it elsewhere, not so much the ways of Death as the steps of Life under difficulties. As things are, our specimens are admirably fixed, they could scarcely be more fixed if Medusa herself had them in keeping, and it requires some faith to believe they were ever less stonily dead. But appearances delude, and if we cannot say of the specimen, as Galileo said of the earth, and yet it moves, "E pur si muove," it is our duty to proclaim that it *has* moved and to demonstrate that movement.

Is, then, the germ to receive no mention? The most prominent figure, perhaps, in modern pathology, shall it not have a corresponding prominence assigned to it in post-mortem room and museum? Well the germ is in a sense *sui generis* and therefore not capable of placing in the same class with those morbid sequences which we have been considering. It is a cause of disturbance, as a mechanical injury, exposure to heat, the incidence of a poison are causes of disturbance—the disturbance once set agoing, the lines of propagation depend upon the structure of the fabric disturbed; it is those lines of propagation which we have been considering. However, the germ is finding its place on the shelves of the museum, and we must therefore ask ourselves, Is it being regarded from the right point of view? It figures there as the microscopic specimen and as the culture in various media—that is, it figures *morphologically*, whether as unit or as colony. But it is the potency of the germ that we want, and we have reason to hold that this potency has less relation to the form of the germ than to the intrinsic qualities of its protoplasm—namely, its powers of elaborating a virus. The germ castigates less as rod or flagellum than as toxin; the morphology of the germ, therefore, should be supplemented, as far as possible, by endeavours to demonstrate the chemical nature of the poison carried, and the direction and intensity of its working. The same principles, therefore, will guide us in the demonstration of the germ as of the morbid tissue: we shall aim at exhibiting its dynamics as a *toxifer*.

* It does not take a moment to throw down an earthy deposit from its solution in a test tube. Why should it take so long to separate it from the blood or from the fluids moistening the tissues?

THE Treasurer of Middlesex Hospital has received from Miss B. Wotton a gift of £500 Consols for the benefit of the cancer charity of the hospital.

NOTES ON DOUBLE CERVICAL RIB,

WITH AN ILLUSTRATIVE CASE,

BY

ROBERT DONALDSON, M.A., M.B., Ch.B., F.R.C.S.Edin.,

LATE SENIOR HOUSE-SURGEON ROYAL SOUTHERN HOSPITAL, LIVERPOOL.

As some attention has recently been paid, especially abroad, to this condition, probably stimulated thereto by the availability of Roentgen rays as an aid towards diagnosis, the following case which came under my notice is not without interest as showing some of the evils attendant on this condition, and the benefit to be derived from operation.

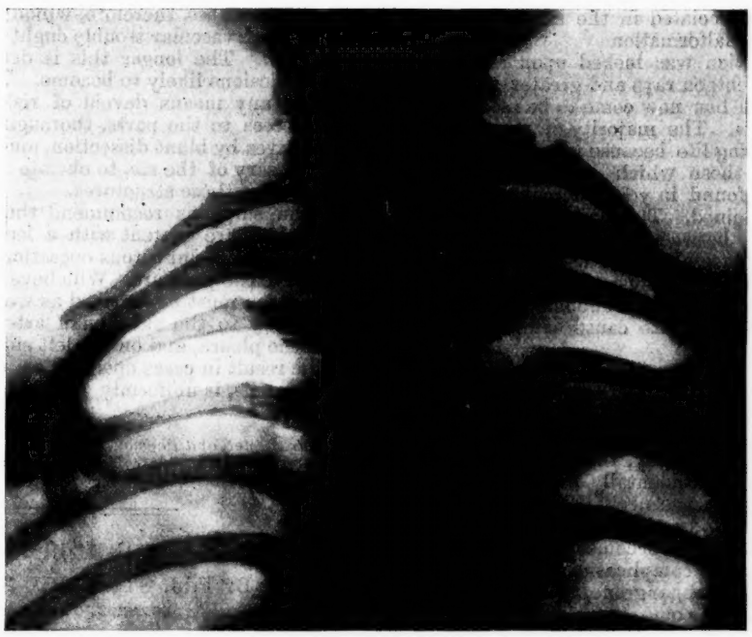
The patient, an unmarried female, aged 22, residing in the North of Scotland, complained of a dull, aching pain in the left shoulder and armpit, weakness in the left arm, and numbness after prolonged use. She also complained of a deformity in the neck, due to the presence of a lump.

History.

The family history presented nothing of interest; so far as the patient knew no other member of the family was afflicted with any similar abnormality. There was nothing in her previous history of importance beyond the fact that she had suffered from enlarged glands in the neck, probably tuberculous, since she was 6 years old, and had been operated on once for this condition.

Eight years previous to the present operation, she discovered quite by accident a small hard lump in the neck about the size of a marble. It was situated just above the left collar bone, and although palpable could not be seen. Pressure over the lump caused pain. Medical advice was sought, and an enlarged gland was diagnosed. Iodine was ordered to be painted over the site of the swelling; this was persevered in for some considerable time, but no benefit was derived.

The patient remained in this condition with occasional bouts of pain in the shoulder till twelve months before I saw her her. Then she noticed that the little lump was gradually getting bigger. The dull, aching pain felt round the shoulder had now become constant and was occasionally felt down the arm. It was unrelieved by anything the patient could do, and was always more pronounced after any slight exertion. There had never been any cramp, tingling sensations, or numbness in the hand or arm. The left side of the neck felt hotter than the right side. She made no complaint, however, about the right side of the neck or about the right arm.



Condition on Admission.

On examining the patient, the contour of the left side of the neck was notably altered by the presence of a swelling or prominence, visible above the mid-point of the clavicle. Its upper border appeared to the eye to be on a level with the cricoid cartilage, while its lower border came within a fingerbreadth of the left clavicle. Its inner margin was separated from the outer border of the left sterno-mastoid muscle by a slight hollow, but its outer limit merged insensibly into the anterior border of the trapezius.

The left external jugular vein was seen to cross the swelling, but perhaps the most noticeable feature was the very marked pulsation over this prominence, so that on superficial examination aneurysm might have suggested itself. On the right side a slight fullness was observed about 2 in. above the right clavicle and in a position corresponding to that on the left side. The only other point to be noted in the examination of the neck was the presence of a few enlarged glands on the left side. There was also present a scar denoting the site of a previous operation for the removal of enlarged glands.

On palpation, etc., strong pulsation was felt over the prominence on the left side of the neck. The very slightest pressure downwards and slightly backwards over the bony mass was sufficient to obliterate completely the left radial pulse at the wrist. Comparison of the two radial pulses showed that the left was much weaker and lagged slightly behind the right. Pressure over the area of fullness on the right side did not detect pulsation. On the left side a very distinct thrill was communicated to the fingers, while, with the stethoscope over the prominence, a loud systolic bruit was heard. There were no other signs of vascular disturbance.

The slightest digital pressure over the prominence elicited tingling sensations, while, with firmer pressure, very severe pain was complained of. Further, by selecting certain spots over the prominent area, pain could be induced either in the axilla, down the front of the chest, or down the inner side of the arm. There was no wasting of any of the muscles of the hand or of the arm, but the patient's grip was slightly weaker on the left side than it ought to have been.

The hard, bony mass could be traced upwards, inwards, and backwards on very deep palpation, as far as its origin from the seventh cervical vertebra. This could also be done on the right side, but with greater difficulty. The most anterior point of the prominence was about 2½ in. from the middle line of the neck, while about 3¾ in. intervened between the middle line of the neck and the outer border of the swelling. The upper limit of the prominence was about 2 in. above the middle of the left clavicle, as already noted, and the lower limit was separated from the upper border of the clavicle by a fingerbreadth. The greatest breadth of the prominence was thus about 1¼ in., and the centre of this was situated about midway between the posterior border of the sterno-mastoid and the anterior border of the trapezius. On the right side the upper limit of the hard mass detected on deep palpation was about 2 in. above the right clavicle, and deep pressure over it caused numbness and tingling down the right arm.

The case was diagnosed as one of double cervical rib, and radiographs were kindly taken for me by Dr. Thurstan Holland, Liverpool. These confirmed the diagnosis and showed beautifully the presence of the abnormal ribs.

Operation.

As the patient was anxious to get rid of her symptoms and to submit to operation for the relief of the same, she was sent into hospital. Mr. Robert Jones made an incision in one of the natural creases of the neck with its centre over the bony prominence. The subclavian artery, as is usual in these cases, was higher in the neck than normal because of its passing over the supernumerary rib. It was found to be adherent by its sheath to the periosteum of the rib, as was also one of the cords of the brachial plexus. These naturally required careful dissection from the rib, part of which was then removed so as to obviate all further pressure on the nerves and to allow the artery to occupy a less constrained position. The only anxiety experienced during the operation was on account of the persistent cyanosis and the extreme shallowness of breathing, which, even after the operation was over, gave some cause for alarm.

After-History.

When last seen the patient was able to use her left arm freely without experiencing any of the tired aching feeling she complained of at first. The arm appeared to be as strong as ever. There was still a slight fullness in the neck, but the marked prominence had gone and no pulsation was visible. The radial artery at the wrist was now equal in volume and time with that at the right wrist.

More or less well-developed ribs are liable to be met with in connexion with the seventh cervical or with the first lumbar vertebrae. According to Turner[1] and Grüber, "cervical ribs may be either the unusually developed rudiments of the anterior transverse process or rib of the seventh vertebra, or merely unusually developed epiphyses." There is an independent development of the costal element on the anterior limb of the transverse process of the seventh cervical—that is, on the anterior root of the transverse process we get an independent centre of ossification,

which may develop and assume the importance of a cervical rib. There are, according to Turner, four types of cervical rib—namely, three incomplete varieties, and one complete, so-called according to the extent of development:

1. Cases in which the costal element is represented by a small projection not much larger than a transverse process.
2. Those in which the costal element is still longer, and whose end is free or attached to the first rib.
3. Those in which the cervical rib is long enough to find attachment to the costal cartilage of the first rib.
4. Those in which the cervical rib actually joins the manubrium sterni, either alone or in conjunction with the first rib.

The first causes no symptoms and the fourth is extremely rare. The majority, therefore, of cervical ribs which cause symptoms, fall into either the second or third groups of incomplete cervical ribs.

As regards the etiology of this condition, opinion is divided. According to Planet,[2] all animals possessed at one time as many ribs as vertebrae, but in course of time these have dwindled down to the number of twelve in man with only rudiments in the cervical region. Some writers accordingly class the condition as a species of atavism. Others have laid stress on the frequency with which several members of the same family are affected. For instance, Israel[3] is of opinion that heredity plays some part, and that there is sometimes a history of degeneracy in some member of the family. Occasionally also the condition is associated in the same person with some other congenital malformation.

Formerly the condition was looked upon as rare, but with the advent of Roentgen rays and greater precision in diagnosis the condition has now come to be recognized as comparatively common. The majority of cases probably pass unrecognized during life because no symptoms manifest themselves. Of those which cause symptoms, the majority appear to be found in young females, the reason for this being undetermined. The age at which symptoms are noticed is generally between 12 and 20, owing probably to the activity of the skeletal growth between these ages.

In those cases which do not cause symptoms, the supernumerary rib probably is not large enough to project into the posterior triangle and there cause symptoms due to pressure or deformity.

Cases which do present symptoms, however, are very frequently diagnosed wrongly, because the neck is not examined for a possible extra rib to account, for example, for the symptoms of a neuritis in the arm. Hence, before the introduction of radiography, the condition was frequently discovered only accidentally, or, if attention was by any chance directed to the neck, the condition was as often mistaken for something else. The condition is now more often recognized, and it becomes possible to relieve pain and to obviate further complications such as possible aneurysm of the subclavian, gangrene, or paralysis of the muscles of the hand. In some cases it is possible, by simple palpation, to diagnose the condition and even to trace the ribs upwards and backwards to the spine. The patient generally complains of the presence of a swelling in the neck, or of symptoms referable to pressure on the artery or on the nerves, or on both. As regards the blood vessels, the vein, owing to its position low down and in front of the scalenus anticus muscle, escapes the injurious effects of pressure, as it is pushed out of the way. The scalenus anticus, in these cases, is generally attached to the cervical rib, either in part or altogether, with the result that the subclavian artery which lies behind it, is lifted high up in the neck by the extra rib over which it dips abruptly and is pressed on by the muscle. It is thus pulled upon and is unable to get away from the pressure. Hence, the more prominent the rib in the neck, the more pronounced will be the pulsation, and hence the mistake sometimes made of taking the pulsating tumour for an aneurysm. Aneurysm has formed sometimes in cases of cervical rib, owing to trauma or to injury to the vessel from continual pressure in the strained position.

A difference in the pulses may often be detected. In the case above recorded the left radial at the wrist was slightly delayed, and of smaller volume when compared with that of the right side. This diminution in the radial pulse is due to compression in the way above described, and, after operation has removed the cause, the pulse generally becomes normal. It is therefore not due to any permanent obliterative condition within the vessel. A bruit, systolic in time, can often be heard quite distinctly over the site of the rib in the neck, due probably to the acute bend of the artery over the supernumerary rib. Other vascular phenomena, such as pallor, coldness, oedema, or even gangrene of the hand, may be present, due to interference with the blood supply, but were absent in my own case.

The symptoms attributable to nerve pressure vary from slight tingling and other paraesthesiae to intense neuralgic pains felt along the distribution of the nerve fibres pressed upon. Pain, if not present, can nearly always be elicited, or if present, aggravated by digital pressure over the bony prominence, and may be made to radiate in different directions according to the fibres pressed on. The effect on the muscles as a result of pressure on the nerves, varies. There may be no apparent effect, or there may be a very appreciable feeling of weakness. This weakness may in turn merge into more or less paralysis of the muscles, generally of the hand, which undergo a certain amount of atrophy.

In the case described above the symptoms were mainly sensory, as the effect of pressure, although causing weakness, had not gone on to paralysis. The symptoms generally point to involvement of the first dorsal nerve root.

The tendency is for matters to get worse either in the direction of increased nerve disturbance or of vascular mischief. Cases, therefore, which complain of progressive nerve or of vascular trouble ought to be subjected to early operation. The longer this is deferred the more serious are the lesions likely to become. The operation, which is not by any means devoid of risk, consists in obtaining free access to the parts, thorough isolation of the artery and nerves by blunt dissection, and removal of as much as is necessary of the rib, to obviate the possibility of further pressure on these structures.

Some surgeons recommend the removal of the entire rib; others are content with a less ambitious and at the same time less dangerous operation, removing just enough to relieve the pressure. Whichever method is adopted, the periosteum must be removed as well. The special dangers are injury to the subclavian artery, to the nerve cords or to the pleura, and on the left side to the thoracic duct.

The result in cases operated on, to judge from reports in the journals, is uniformly good.

REFERENCES.

[1] *Journ. Anat. and Physiol.*, vol. iv. 1870. [2] *Tumeurs osseuses du cou*, Thèse, Paris, 1890. [3] Israel, *Berl. klin. Woch.*, li, 1901; *Archiv für Kinderheilkunde*, Stuttgart, 1905, xli, 205.

A NOTE ON FORMALIN IODINE CATGUT.

BY F. J. STEWARD, M.S., F.R.C.S.,
SURGEON, GUY'S HOSPITAL.

I HAVE now used iodine catgut prepared in various ways for more than three years, and for the last two and a half years I have been using that prepared by the method I am about to describe for all purposes and with uniform success. When I say with uniform success, I mean that (1) it has not in any case been known to be absorbed too soon; (2) it has not been known to cause any irritation; (3) it has not caused any stitch abscess, showing that it is uniformly sterile.

My experiences as regards the use of iodine catgut are as follows:

In the first place, Claudius iodine catgut was used—that is, ordinary raw catgut steeped in 1 per cent. iodine for ten days. This was given up because it soon became brittle, and because the surface was rough and uneven. In other respects it was satisfactory.

Next, catgut prepared by the method suggested by Salkindsohn was tried—that is, ordinary raw catgut steeped in iodine dissolved in spirit and water. This was also given up, as the catgut swelled to an inconvenient size, and also became much too elastic. In other respects it also was satisfactory.

I then began to prepare, and have, as I have said, used continuously for about two and a half years, formalin iodine catgut. This is ordinary commercial formalin catgut, obtainable from any instrument maker, made up into short skeins (each skein containing about the right

quantity for one operation), and steeped in 1 per cent. solution of iodine in water for ten days. It is usually sterile in five days, but I say ten, for safety's sake.

At the commencement of the operation, skeins of the sizes required are picked out of the stock jars with sterile forceps, and placed in carbolic acid, 1 in 20, till needed. This dissolves out excess of iodine, which might possibly cause irritation.

The advantages of this preparation over any other variety of catgut that I know of are:

1. Its preparation is extremely simple, and can be carried out quite easily by surgeon or house-surgeon. The advantages of this over suture material prepared by complicated processes by instrument makers and others are obvious.

2. It is very strong, although after it has been kept for several months the very fine sizes do certainly become brittle.

3. It is very resistant, and there is consequently no fear of too rapid absorption.

4. It is beautifully smooth, uniform in diameter, inelastic and delightful to handle.

These characters constitute the main advantages over the other varieties of iodine catgut that I have mentioned, the ordinary Claudius catgut being rough, uneven, and brittle, and the Salkindsohn being soft and elastic, and consequently unsatisfactory for tying knots.

Owing to its tensile strength and its resistance to absorption quite fine sizes can be used, and so the difficulty of threading needles is overcome. For instance, for skin sutures the No. 000,000 is used. This does not become absorbed for eight to ten days if the wound is dry, and thus lasts long enough to ensure firm union but does not require removal. Moreover, being very fine, the stitch holes soon disappear. For intestinal work, peritoneum, etc.—the No. 00 is used and has given complete satisfaction. For muscles, aponeuroses, and tendons, etc., the No. 1 or No. 2 is used. This is not absorbed for quite a month, as is shown by the fact that on two occasions when it became necessary to reopen abdominal wounds on the twenty-fifth and twenty-seventh day after operation respectively, the No. 2 catgut sutures that had been used for muscle and aponeurosis were not only not absorbed but were still quite strong.

In addition to the advantages that I have already mentioned, it may be noted that there has been no case of tetanus, or disease simulating tetanus, in all the hundreds of cases in which this material has been used.

CHRONIC OEDEMA OF THE FACE AND MUCOUS MEMBRANES.

By JAMES ADAM, M.A., M.D.,

AURAL SURGEON, GLASGOW ROYAL INFIRMARY DISPENSARY.

CHRONIC oedema of the face is not a common condition, and, although Sir Jonathan Hutchinson[1] clearly described it in 1883, its true nature, and still more its appropriate treatment, have not been sufficiently understood. This is obvious, not only from the fact that the two cases now recorded had been to many doctors, specialists and hospitals, without benefit, but also from the fact that, regarding two cases, apparently similar, recently exhibited in London and New York, most divergent opinions were expressed, especially as to treatment.

CASE I.

My first case[2] was a joiner, aged 22, who had suffered from the condition for nearly three years. In 1902, scab formation began to trouble him at the orifice of the left nostril; in 1903, swelling began at the inner canthus of the left eye, and slowly increased, involving the cheek and side of nose. By his doctor's advice he had six teeth extracted. In 1904 he saw two specialists in Edinburgh.

In 1905, when I first saw him, solid oedema extended from eye to mouth, and from the nose over the whole cheek; it caused him much mental misery owing to the disfigurement. There was no pain or tenderness, but occasionally a feeling of heat and a red flush; the edges of the nostrils, especially the left, were covered with thick, hard crusts; the mucous membrane of both inferior turbinals was much thickened, that on the right showing a growth, like a small cherry, occluding the nostril. The tissue of the soft palate and uvula was much thickened; adenoids were still present.

I regarded the condition as one of eczema of the nostrils, with a chronic erysipelatous process grafted on it, and asked Dr. Alex. Morton to see the case. He agreed with me, and the treatment we adopted was the removal of crusts in the nostrils with H_2O_2, followed by application of $AgNO_3$ dissolved in sp. aeth. nit., and by Brooke's ointment; reduction of turbinal hypertrophy, removal of adenoids and tip of uvula; application of mercurial ointment to cheek, overlaid with cotton-wool and a firm elastic bandage; iodide and thyroid internally.

After two months the oedema disappeared, and remains cured; there is still slight thickening of the soft palate and inferior turbinals.

CASE II.

The other case was referred to me at Glasgow Royal Infirmary by Dr. Morton, Dermatologist to the infirmary. A woman, aged 22, had had chronic oedema of the left cheek, upper lip, and the left lobule of the nose for four years, had attended several hospitals, and seen nine doctors. The oedema, especially that of the upper lip, was very disfiguring; crusts were found inside the left nostril, and an ulcerated groove down the centre of the mucous surface of the upper lip, due to the sharp and carious edges of the everted central incisors.

The treatment adopted was similar to that in Case I, but the lip proved somewhat obstinate, owing to difficulty in dealing with the teeth. It has taken six months to cure the case. The antrum was healthy. A culture from the labial fissure gave mixed staphylococcus and streptococcus; a vaccine was prepared accordingly by Dr. J. A. Campbell, and four injections given at twelve-day intervals, and then discontinued. The condition was improving by this time, but whether the injections had material influence is doubtful.

The tumour-like tissue from the first case was kindly examined by Dr. R. M. Buchanan, Bacteriologist to the City of Glasgow. He reported:

> At one point there is some superficial ulceration; here there is distinct cell proliferation; also the orifice of some of the mucous ducts is distended with retained secretion. The structure of the tissue is dense fibro-cellular, very vascular, and rich in mucous glands. The numerous irregular channels are venous and not lymphatic; no lymphatic obstruction can be definitely recognized; no evidence of bacterial invasion; no streptococci after culture.

This report cannot be regarded as conclusive for various reasons, of which the only one that need now be mentioned is that the tissue was intranasal and some distance from the primary seat of invasion, and therefore not certain to show the essential lesion.

Sir Jonathan Hutchinson, when in 1883 he first drew attention to cases of solid oedema of face, expressed the opinion that the condition was due to recurrent attacks of erysipelas, and of the same nature as elephantiasis. In 1888 he said that the condition in all typical cases ought to be symmetrical; if only on one side of the face, some local cause ought to be suspected; that the attacks of erysipelas which produce these conditions are in some cases very frequent, and usually attended by great swelling; after each attack more and more deformity is left. "The treatment is the liberal use of tonics, and especially of steel, and the avoidance of sudden changes of temperature. If it occurs in early life, I think it is generally outgrown in the end."

I wish to point out (1) that the disease is a local and not a constitutional one; (2) that, so far as the face is concerned, the primary lesion is probably always one of a mucous membrane, or more usually of a mucous orifice; (3) that the oedema may affect the mucous membrane as well as the skin; (4) that the condition is curable.

That the condition has nothing to do with any constitutional dyscrasia seems obvious from the clinical history of the cases, from the results of local treatment, and from the fact that in most of the cases no constitutional taint has been discoverable in either the family or personal history. Both of my patients are of excellent physique. Erysipelas of the face in most cases starts from some fissure about the nose, less usually from about the eyes or ears; when frequently recurrent the nose ought always to be carefully supervised; in this way recurrence can often be prevented. Several of the published cases, as well as both of mine, had crusts in the nostrils.

That the offending microbe is always the streptococcus is not proved, but it is the most likely. In any case, there is a chronic infective lesion of recurring potency, and the "solid oedema" is obviously a local defensive barrier against systemic invasion. That such an oedema, therefore, should be, as Hutchinson suggests, symmetrical in typical cases, is unlikely; it was not in either of mine. That chronic oedema of such origin should appear in mucous membrane as well as in skin is likely, but does not seem to have been definitely stated; yet it is well

known to occur in connexion with acute lesions. In their recent elaborate report on the oedemas of the larynx, Bourgeois and Egger[3] mention, among chronic lesions, only tuberculosis, syphilis, and cancer. With regard to his case of solid oedema of face, Mr. Herbert Tilley expressly said that the nose was normal, so far as he could see; but, curiously enough, at the same meeting of the Laryngological Society in 1906, Mr. Scanes Spicer showed a case of chronic oedema of the larynx in a teacher, almost certainly not tuberculous, and he raised the question whether it might not be a septic infection of dental origin. Halsted's remarkable case, shown to the American Laryngological Society in 1908, is most interesting in this respect:

A woman of 30, with personal and family history absolutely free of all constitutional taint, had a peritonsillar abscess; this had not cleared up four months later, when some pus was let out from the anterior pillar, and there was thickening of the soft palate and over the arytenoids, and crusts in the right nostril; a month or two later excoriation of the nostrils was noticed; three years later the condition was still the same, fissure and redness at tip of nostril; again, at five years' date from the quinsy, the same condition, except that the patient had just had "an attack of what her physician diagnosed as facial erysipelas, differing from erysipelas in that a thickening of the lip and of the skin over the cheeks persisted after the active disease had subsided." She has recently had five or six of these erysipelatoid attacks with increase of oedema over face. Her physician, Dr. Dana, had given up his idea that the attacks were erysipelas; Halsted regarded them as a persistent angio-neurotic oedema involving the face with "some underlying cause, constitutional or local, some dyscrasia, the nature and source of which we do not know."

The interest of this case is that, first, we have an infective focus in the mucous membrane remaining uncured for four months; by this time an oedema of the surrounding mucous membrane indicating spread of infection has developed, and remains confined to it for three years; then the characteristic solid oedema of the face develops, with crusting of nose and typically recurrent erysipelatoid attacks. Angio-neurotic oedema is something quite different, and depends on a toxaemia usually of intestinal origin; as Bourgeois and Egger say, "Il suffit de la connaitre pour poser le diagnostic." It is clear, then, that a chronic septic infection of a mucous membrane or about a mucous orifice may cause oedema of the membrane long before it affects the skin; this almost certainly happened in both my cases.

The essential point in treatment is to get rid of all septic foci; till this is done attempts to deal with the oedema are worse than useless. Crusts about the nostrils are best got rid of by H_2O_2 solution; the surface is then dried, $AgNO_3$ dissolved in sp. aeth. nit. immediately applied to fissures, followed by an antiseptic ointment. For the oedema I have used ung. hydrarg. co.* covered with cotton-wool in thick layer, and pressed down by cotton elastic bandage; this only at bedtime. This treatment was continued for months, and was considered more important than the iodide or thyroid which were given internally.

REFERENCES.

[1] Sir J. Hutchinson, *Medical Times and Gazette*, 1883, I, p. 4; also *Illustrated Medical News*, October 20th, 1888, p. 82. [2] This case was shown at the Glasgow Medico-Chirurgical Society, May 3rd, 1907, *Transactions*, vol. vi. [3] Bourgeois and Egger, Les oedèmes du larynx, *Revue Hebd.*, May 22nd, 1909, p. 611.

SUPPURATION TREATED BY VACCINES.

BY S. MALLANAH, M.D.EDIN.,

HYDERABAD, DECCAN.

CASE I.

A LABOURER, aged 40, with a chronic varicose ulcer of the right leg of one year and a half duration, came for treatment at a local dispensary. The ulcer had a very unhealthy appearance, was somewhat circular, being in diameter 2 in., and resisted the routine antiseptic treatment for nearly a month. I isolated a pure culture of *Staphylococcus pyogenes aureus* from the discharge, and prepared a vaccine containing 100 million of organisms per c.cm. On August 15th, 1907, half a c.cm. of this vaccine was given subcutaneously in the right thigh. On August 16th, 1907, there was a profuse discharge, and on August 17th a scab formed over the ulcer, and no dressing was applied. On August 21st the scab fell off, and I was astonished to see the ulcer completely healed.

* Dr. Morton prefers Brooke's ointment: Acid. salicyl., gr. 30; ichthyol, gr. 60; ung. hydrarg. oleat. (5 per cent.), pastae zinci co., ää ʒss.

CASE II.

A patient, aged 56, suffering from a large carbuncle on the back. He was weak and anaemic, and had a temperature of 101° F. The size of the carbuncle was 10 in. from above downwards and 9½ in. from side to side. There were about forty apertures scattered all over the surface, through which thick slough could be seen. The skin around was brawny in appearance. The urine was free from sugar. *Staphylococcus pyogenes aureus* was isolated from one of the pustules, and a sterilized emulsion, containing 10 million organisms, was prepared and injected in the arm on October 6th, 1907. On October 8th, 1907, all the apertures became larger, and there was free discharge of thick fluid pus from every opening. The growing edge seemed to become somewhat paler. On October 11th a second injection was given subcutaneously, the vaccine fluid containing 20 million organisms. On October 14th all the apertures were found suddenly closed up—that is, healed—and a big slough was left in the centre. On October 18th a third injection was given, containing 20 million organisms. On October 20th, 1907, a big gap formed in the centre, and the whole of the slough was extruded through it. There was a big cavity left, covered with granulations, which communicated with the exterior through a large opening in the centre. On October 24th a fourth injection, containing 30 million organisms, was administered. The whole cavity healed, leaving a central oval ulcer, which became covered with healthy granulations, and on November 17th, 1907, the whole was completely cured.

CASE III.

An officer in the Revenue Department, aged 37, suffering from diabetes for a number of years, consulted me in the month of February, 1908. He had a large crop of boils upon the thighs and legs, and was passing 4½ pints of urine a day, containing 20 grains of sugar to the ounce. *Staphylococcus pyogenes aureus* was isolated from one of the boils, and a vaccine containing 20 million of organisms per c.cm. was prepared. Three injections, repeated every fifth day, completely cured the crop of boils. The quantity of sugar fell to 5 grains an ounce during treatment, although the diet was not changed.

CASE IV.

A man, aged 60, belonging to the Customs Department, presented a carbuncle about the size of a fist, situated over the front of the chest on the right side. He complained of frequency of micturition, and the urine contained a trace of sugar, which disappeared later on during the treatment. *Staphylococcus pyogenes citreus* was isolated, and four injections of sterilized emulsion of this organism given every four days completely cured his condition within sixteen days. The first injection was given on August 11th, 1908. The vaccine contained 20 million organisms per c.cm. The rise of temperature recorded was only 100° on the day of inoculation: during the treatment a crop of boils, four in number, developed on August 15th, 1908. One appeared over the left upper eyelid, one on the left cheek, one over the right forearm, and one over the belly above the umbilicus. All these boils aborted after the third injection. The opsonic index was taken in this case only, it was 0.6 before injection, and after injection it rose to 1.2.

CASE V.

A diabetic, aged 42, suffering from abscesses and boils for nearly a year, consulted me in September, 1908. He had been operated on several times without much benefit. He was passing 4 pints of urine daily, containing 30 grains of sugar to the ounce. The abscess was about the size of an orange; a small opening was made to allow a free flow of pus, because in a closed abscess an outlet is always necessary for the free discharge of pus, which increases a few days after the vaccine. Three injections of *Staphylococcus pyogenes aureus* isolated from the pus of the abscess cavity completely cured the abscess and the boils. There was a considerable reduction of sugar during the treatment. The opsonic index in diabetes is generally very low, varying from 0.3 to 0.6, and hence vaccine inoculation will be very useful in cases of diabetics to protect them from getting boils if used prophylactically.

CASE VI.

I was consulted in March, 1908, as to a boy aged 15 who was in a very low state of health, and had on the inner side of the left cheek cancrum oris, which was rapidly increasing in spite of the local application of strong nitric acid. His condition was considered hopeless at the time. Three injections of vaccine prepared from staphylococci isolated were given every third day, and completely cured the malady within fourteen days.

CASE VII.

A girl aged 10 suffering from suppuration of the middle ear for more than two years was completely cured by six vaccine injections of *Bacillus pyocyaneus* isolated from the case, and given every fifth day in May, 1909. In this case every other treatment was useless.

THE Lord Mayor of London laid on September 22nd the foundation stone of a home for the nurses of the City of London Asylum at Stone, near Dartford, to be built in the grounds of the institution. The object of the home is to provide the nurses with a place of recreation and rest apart from the asylum building.

UNCURED RICE AS A CAUSE OF BERI-BERI.

By W. GILMORE ELLIS, M.D., M.R.C.S.,
MEDICAL SUPERINTENDENT AND MEDICAL OFFICER BERI-BERI HOSPITAL, SINGAPORE.

The theory of the relationship between rice-eating peoples and beri-beri is very old. As long ago as 1892, the perusal of some old Japanese reports caused me to institute some experiments on a small scale, experiments that were misleading.

The disease, endemic since the opening of the Singapore Lunatic Asylum in 1887, broke out in an appalling manner early in 1896 and resisted all endeavours to combat its ravages until towards the end of 1901, when I began to experiment with Bengal (cured) rice.

Table showing Number of Patients, Number of Cases of Beri-beri and Deaths, Singapore Lunatic Asylum, 1896-1908.

Year.	Average Daily Number of Patients Resident in Asylum.	Total Treated for Beri-beri.	Total Deaths.	Deaths from Beri-beri.	Percentage of Deaths from Beri-beri to Total Deaths.
1896	233	165	85	40	47.06
1897	228	189	81	48	59.26
1898	208	201	95	55	57.89
1899	184	121	65	29	44.61
1900	180	153	123	51	41.46
1901	164	102	56	15	26.79
1902	174	99	42	4	9.52
1903	209	21	55	3	5.45
1904	268	15	59	1	1.69
1905	287	38	67	3	4.47
1906	290	0	75	0	—
1907	292	101	57	10	17.54
1908	326	18	65	2	3.07

In these earlier experiments carried on throughout the years 1902 and 1903 some of the patients were given a diet with cured rice and some with uncured rice for varying periods, and from watching the results, I was inclined to think, for the first time, that there might be something in the theory, so persistently maintained by Dr. Braddon, that the consumption of stale uncured rice was in some manner the causative agent of the disease.

In 1904 all patients were kept on cured rice until October 16th without a case of beri-beri occurring; upon this date a change was made to uncured rice, with the result that we had 15 cases in December with one death.

Throughout 1905 several changes were made from cured to uncured rice and back again. These experiments so increased my belief in the theory that in 1906 we ran the first eleven months of the year on cured rice and without a single case of beri-beri. This result decided me to make one last and systematic trial of the two varieties of rice, and I determined that for a year or longer all patients should be placed alternately four months on a diet containing cured rice and four months on uncured rice. Our full native diet consists of rice, 1½ lb.; meat, 4 oz.; fish, 4 oz.; vegetables assorted, 6 oz.; salt, ½ oz.; onions, ½ oz.; garlic, ⅛ oz.; and lard ½ oz. daily. This trial was carried out with the exception that the second and third spells of four months on uncured rice were cut short on account of the rapid manner in which patients from all parts of the asylum succumbed to beri-beri.

I am happy to say that on cured rice we have had no recurrence of the disease for over a year. It is needless to say that a return will never be made to the uncured grain. A few new patients have been admitted with beri-beri, but all have made rapid recoveries.

Formerly relapses were frequent and difficult to deal with in beri-beri outbreaks, and this is to be understood when one considers that sick patients were put on bread and milk diet, all rice being cut off. Upon convalescence and a return to full diet further doses of poison were ingested, with the natural result.

At the Beri-beri Hospital (120 beds) on the sea coast 5 miles from Singapore, opened on April 14th, 1907, 738 patients have passed through my hands with only 20 deaths, and only 8 of these were due to beri-beri. The healthy site, the open-air treatment, the daily sea-bathing (all patients are kept in the sea for half an hour daily and massaged), the prohibition of uncured rice are doubtless the factors in our success. I may say that we never have a case relapsing to the slightest extent. It is gratifying to watch the bedridden begin to feed themselves and then to crawl, the crawlers commencing to walk with the help of two sticks; to see first the one stick and then the other discarded, and finally to see the patient become a sound man once more—of course, often a matter of many months in the chronic cases. Several patients unable to stand or even lift their hands have been discharged recovered within six months—if they may be called recovered before the return of the knee-jerks, a return that may have to be waited for for years in my experience.

Braddon has written in his book, *The Cause and Prevention of Beri-beri*, very fully on the different methods of rice curing. That we use is Siam rice soaked in water for forty-eight hours, the water being once changed. It is then placed in boilers and steamed (not under pressure) until the grains burst, generally a matter of from ten to twelve minutes; it is then sun dried, and afterwards goes through the mill, and is husked in the ordinary way.

SEVENTY-SEVENTH ANNUAL MEETING
OF THE
British Medical Association.

Held at Belfast on July 23rd, 24th, 26th, 27th, 28th, 29th, and 30th.

PROCEEDINGS OF SECTIONS.

SECTION OF SURGERY.

Thomas Sinclair, M.D., F.R.C.S.,
Professor of Surgery in the Queen's University of Belfast, President.

PRESIDENT'S INTRODUCTORY REMARKS.

Gentlemen,—My first duty on taking the chair is to thank you for the honour you have done me in electing me President of this important Section, and to express my high appreciation of the distinction attached to this office.

I rejoice that I have associated with me as Vice-Presidents some eminent surgeons, whose support and guidance in the business of the Section will be helpful and encouraging; and I trust that the matters discussed and the papers read will prove of great interest and instruction, so that the Belfast meeting may not be without permanent and illuminating influence upon our surgical thought and practice.

My next duty is the exceedingly pleasant one of welcoming the members of the Section to Belfast, and to the Queen's University, in which, through the kindness and sanction of the Vice-Chancellor and the Academic Council, we are privileged to hold our meetings.

Since we last had the pleasure and advantage—twenty-five years ago—of entertaining the British Medical Association in this town many important changes have occurred, which some of the older and more experienced members who were with us on that occasion will recognize. Belfast has graduated from a town to a city, and its Queen's College has been erected into a university. Although the university has scarcely emerged from its embryonic stage, great preparations for its birth have been in progress for some time in the provision of numerous well-equipped laboratories—many of them in connexion with the Faculty of Medicine. Indeed, recently, through the generosity of benefactors, we were enabled to open in one day no less than seven new laboratories. Moreover,

in the same interval, the general hospitals in Belfast have been rebuilt and extended on modern lines and in more open and attractive sites; while the population of the city has increased at the phenomenal rate with which we are familiar in the development of American and Colonial cities.

As the President of the Association has touched upon these developments—or one might call them transformations—in his comprehensive address last evening I need not dwell upon them, though I should point out for the information of those exploring our new hospitals that these two medico-chirurgical hospitals afford an excellent opportunity of contrasting two totally different types of hospital construction. The Royal Victoria Hospital is built on the one story pavilion plan, with the artificial or "plenum" system of ventilation and heating, and with peculiar arrangements for lighting, securing comparative freedom from dust and flies. The Mater Infirmorum, on the other hand, is built in superimposed stories with a garden roof or recreation ground for convalescents, and with a natural type of ventilation, illumination, and heating such as are found in the best houses. It may be instructive to some of our members interested in hospital construction to examine these hospitals, and contrast their various features.

May I extend a hearty invitation from the staffs of both hospitals to the members to inspect the hospitals. Representatives of both institutions, by favour of your suffrages, are with me as Vice-Presidents upon this platform, and I am sure they will cordially emphasize or endorse my invitation. It will give us great pleasure to conduct the members over our wards, and explain any details that may excite attention.

I must, however, recollect that the rules for sectional meetings virtually prohibit the President from delivering a formal introductory address, unless he actually undertakes to open one of the discussions. Now I feel sure I shall best consult the wishes of the Section by not anticipating by my observations the surgeons of high eminence and attainments who have kindly consented to inaugurate the discussions.

May I bespeak your indulgence for another moment or two if I briefly draw attention to the class of cases which bulk most largely in our surgical practice in this city and district?

Belfast is an industrial centre, and in its development until lately the utilitarian principle has been more in evidence than the artistic. In most people's minds the city is mainly identified with the linen trade and shipbuilding, but very many other industries carried on here provide employment for both sexes of all ages. The city attracts whole families from country districts by this variety of employments, and by the educational advantages—primary, secondary, and technical—it affords to the members of such families.

As might be expected, occupational diseases of various sorts abound, and on the surgical side the casualty practice is enormous. Injuries to the head and spine and limb fractures are plentiful, enabling my distinguished predecessor, Professor Gordon, to collect an unrivalled array of fracture specimens for the college museum and to add notably to the surgical literature on fractures. Accidents to the eyes and hands from the spinning mills, bleaching, dyeing, and laundry works, from the many mineral water establishments, and from the distilleries and tobacco manufactories, etc., are numerous.

On the other hand, our wards rarely contain aneurysms, and in correlation with this fact the incidence of syphilis on our ward population is singularly light. Stone in the urinary organs, apart from prostatic diseases, though commoner than formerly, does not bulk largely, and acute gout is practically unknown in our hospital practice, but rheumatoid arthritis is quite common. We have quite an extraordinary number of gastric and duodenal ulcers to treat, furnished by the underfed tea-drinking workers of the mills and factories; and on occasion as many as three gastro-enterostomies may be carried out in the same hospital theatre on one morning, so that our experience in this field grows apace.

Notwithstanding the influx of new blood from the rural districts to which I have alluded, tuberculosis is still far too prevalent among us, and quite an extraordinary number of tuberculous gland, bone, and joint cases flood our wards, and constitute almost one half of our surgical work. Spinal caries is very common, and some of my colleagues have had remarkable success in the operative treatment of these rather unpromising cases. One would expect that the immigrants from the country would exhibit the most resistance to tuberculous infection, but this is not so, the incidence of this disease being quite as often and as speedily manifested in these as in the human product of the city. This is probably due to the indifferent feeding of country children and consequent want of stamina on their arrival in the city. It would indeed be a positive relief to the operating surgeons here if our distinguished townsman, Sir Almroth Wright, and his co-workers could improve and perfect their method of combating the ravages of tuberculosis, thus lessening our operative labours in this domain. For so far we have but few conspicuous successes from substituting "tuberculin" injections for operative methods in the surgical or caseating type of tubercle in glands, bones, joints, and spine, but we cherish the hope that this highly scientific and rational plan may be successfully elaborated, and ultimately prove more fruitful.

We may now proceed to our regular business of to-day, which is the discussion on the proper selection of cases for operative treatment in obstructive jaundice. We are very fortunate in having two such distinguished surgeons with large operative experience in this difficult field—Mr. Moynihan and Sir Thomas Myles—to introduce the discussion. I am sure you will accord them a hearty welcome and an attentive hearing.

DISCUSSION ON THE OPERATIVE TREATMENT OF OBSTRUCTIVE JAUNDICE AND THE PROPER SELECTION OF CASES.

OPENING PAPER.

By B. G. A. Moynihan, M.S.Lond., F.R.C.S.Eng.,
Surgeon, Leeds General Infirmary.

In the proper selection of cases of obstructive jaundice for surgical treatment, the surgeon may find his capacity for accurate diagnosis taxed to the very utmost. It is true that there are certain types of case easily to be recognized, about which hardly any doubt or difference of opinion can be entertained, but it is also true that there are elusive cases in which no refinement of clinical acumen, nor any subtile investigation of the chemical changes occurring in the body, will enable a confident diagnosis to be made. Such cases cannot be too closely examined, nor too strictly debated, and a discussion such as this will doubtless help to throw light upon a difficult, interesting, and important problem.

Diagnosis.

In endeavouring to arrive at an accurate diagnosis in a case of obstructive jaundice, and therefore at a proper selection of those cases for which surgical treatment is necessary, three separate branches of inquiry must be followed. These are concerned with: (1) The clinical history; (2) the physical signs; (3) the chemical investigation of the urine and faeces.

1. *The Clinical History.*

I am inclined to think that a close inquiry into the most intimate details of the clinical history will afford the most substantial help. The exact details of the mode of onset of the jaundice must be ascertained. In some cases the onset is most insidious; the slight tinge of sallowness in the skin is not at first recognized as being due to a faint jaundice, and the earliest discovery of the patient's condition is made, not by himself but by another, who comments upon his altered appearance. It is then noticed that by slow degrees the jaundice deepens. There is neither haste nor pause in the process, and to the patient, and to those who see him constantly, the change may seem imperceptible from day to day. The progression is never checked, nor is there at any time a temporary lessening of the colour. The change is slow, and is always from a lighter to a deeper tinge. Finally a jaundice which the older physicians described as "black" may be seen; the colour is intensely deep and is dark green,

rather than yellow or "black." The deep green tinge of the skin, together with the amber colour of the conjunctivae, makes the appearance of the shrunken features of the patient very striking. In a patient whose jaundice has so progressed, the constitutional symptoms are significant. A period of general weakness, ill health, and emaciation may have preceded, and will certainly have accompanied, the jaundice. There is rarely any pain, usually indeed the patient denies the experience of any discomfort. He complains chiefly of a general languor, increasing feebleness and loss of flesh, distaste for food; and as the bodily health and vigour decrease so the jaundice deepens.

In another and very dissimilar class of case, the jaundice will appear abruptly; and is then preceded, with the rarest exceptions, by an acute, often agonizing, attack of pain. Within a few hours of the cessation of the agony, and before the stiffness and soreness which it leaves behind have passed away, the skin may be everywhere tinged with yellow, the urine is dark, and in a day or two the motions are pale and clay-coloured. The jaundice rapidly deepens, and may then gradually subside, and in a few days may pass completely away. Or it may be otherwise: the jaundice may deepen at first rapidly, and then may seem to attain its maximum, and remain stationary for a period that varies from a few days to a few months. At the end of this period something occurs—it may be a rigor, or a repetition of an attack of pain of the same character as the original seizure, or both may occur together. Soon it is clear that the jaundice is perceptibly deeper, but within a few days it begins to lessen, and may seem almost to clear away. But soon another attack of pain occurs, often accompanied or preceded by a rigor or a sensation of chill, the temperature rises rapidly, and presently the jaundice begins to deepen. This sequence of events is repeated sometimes with the most exact regularity, but usually with apparent caprice. The jaundice may at last become very slight indeed, and I have known it to be so constant and sustained a feature of the case that the recollection of the patient, and of the relatives, of the original natural colour of the skin has long been forgotten. When, however, an operation has removed the obstructive causes of the jaundice it is seen that what has been so long called sallowness is really a discoloration of the skin by bile. In such a case the orderly repetition of the rigor with the accompanying abrupt elevation of the temperature may lead to a diagnosis of malarial fever.

The foregoing represent the two chief types of obstructive jaundice, the one beginning insidiously without pain, and going on unchecked to the deepest tinge—the "black jaundice" of the older writers—the other beginning abruptly, and then following upon an acute and agonizing attack of pain, deepening for a time, but at length yielding, only to increase again and again, it may be, upon the recurrence of acute seizures of epigastric pain. The former type appears commonly in those who have before suffered little or no abdominal trouble, who have been free from all "indigestion," and in robust health to the moment of the onset of jaundice, and who then rapidly waste and lose all interest in, or capacity for, their ordinary daily tasks. The latter type appears always in those who have suffered long from flatulence, indigestion, colic, and all the characteristic "inaugural symptoms" of gall stones.

The conditions which may cause the first type of jaundice, due to a progressive, unremitting, and finally complete obstruction of the duct, are:

1. Carcinoma of the pancreas.
2. Carcinoma of the common hepatic, cystic, and common ducts.
3. Carcinoma of the ampulla.
4. Stricture of the common hepatic or common bile ducts.
5. Stricture of the ampulla due to the cicatrix of a duodenal ulcer.
6. Compression of the common duct from without—for example, by the scar of a duodenal ulcer, by a large stone in the cystic duct, by enlarged glands in the portal fissure or below it; rarely by carcinoma of the stomach or duodenum.

The conditions which may cause the second type of jaundice, due to an obstruction, at first perhaps complete, but soon becoming incomplete and variable, are:

1. Stone in the common hepatic or common bile duct.
2. Chronic pancreatitis, with or without stone.
3. Hydatid cysts in the common duct.
4. Pressure from without, as in renal and other tumours.

2. *Physical Signs.*

(*a*) In these two types of case the condition of the gall bladder affords a sign helpful in differential diagnosis. In the former class the gall bladder is dilated; in the latter contracted. The recognition of this fact we owe to Courvoisier. "Courvoisier's law," as it is called, asserts that "in cases of chronic jaundice, due to blocking of the common duct, a contraction of the gall bladder signifies that the obstruction is due to stone; a dilatation of the gall bladder that the obstruction is due to causes other than stone." Violations of this law, as of all clinical laws, are found, but an extended inquiry revealed less than 10 per cent. of error. The errors, moreover, are not so significant as this statement would lead one to suppose; for, as a rule, inquiry into the other conditions of the case makes the diagnosis clear. The infractions of the law are found in the following circumstances:

1. Where there is a stone or a stricture in the cystic duct causing hydrops or empyema, together with the acute impaction of a stone in the common duct.
2. Where there is a stone in the cystic duct pressing upon the common duct.
3. Where there is distension of the gall bladder by an acute inflammatory process, with obstruction of the common duct by stone.
4. Where there is chronic induration of the head of the pancreas, with a stone in the common duct.
5. Where there is malignant disease of the common duct at any part of its course, or cancer of the head of the pancreas, and a chronic sclerosing cholecystitis.

(*b*) The presence of an ovoid or oblong abdominal tumour in the lower epigastric region, or at the junction of the epigastric and right hypogastric areas, is significant of an enlargement of the pancreas. This enlargement may be due to a malignant growth in the pancreas, the swelling then being hard, a little irregular and painless; or it may be due to a chronic inflammatory deposit in the gland, the swelling then being rather softer and decidedly more painful. It is rare, decidedly, for a malignant tumour in the head of the pancreas to be felt on examination; it is not very infrequent, especially in thin people, for an inflamed and enlarged pancreas to be palpable.

(*c*) Enlargement of the liver is generally noticed in cases of biliary stasis. When the obstruction is intermittent, as in calculous impaction, the variations in the size and in the tenderness of the liver may easily be recognized. After an acute seizure of pain the jaundice deepens, and the liver becomes larger, more easily palpable, swollen in fact; and it is decidedly more tender. Irregular bosses on the surface of the organ are strongly indicative of carcinoma.

(*d*) The presence of free fluid in the abdomen is very suggestive of malignant disease. In the late stages of cancer of the head of the pancreas, ascites with oedema of the lower limbs is rarely absent. But ascites which is due to pressure upon the portal vein may result from the impaction of a stone of large size in the cystic or common ducts. In *Gall Stones and their Surgical Treatment* (second edition, p. 211) I have recorded a case in which a large stone, fixed in the cystic duct, had so compressed the portal vein and the common bile duct as to cause jaundice and ascites, for which the patient was several times tapped in the belief that malignant disease of the pancreas or liver was present.

3. *Examination of the Urine and Faeces.*

The work of Cammidge on the condition of the urine and faeces in cases of obstructive jaundice and of pancreatic disease has, I feel sure, given us great assistance in arriving at a correct diagnosis in those difficult cases where the ordinary clinical signs leave one in great perplexity and doubt. In the case just quoted, for example, an examination of the urine would have shown the absence of pancreatic disease, and the faeces would probably have contained some small quantity of stercobilin. The characteristic needle-shaped crystals can be obtained from the urine when treated by Cammidge's method in cases of pancreatitis, acute or chronic. In cases of malignant disease they are found only in about one fourth of the cases, and in these a zone of inflammation probably surrounds the cancerous area. If the obstruction to the common duct is above the pancreas, and is complete, no bile will pass into the intestine, the stercobilin reaction

will therefore be absent from the faeces, and all the pancreatic juice will pass into the bowel. The digestion of food will therefore be unaffected. A deficiency of pancreatic juice is shown by the fact that the fat-splitting process is being inadequately performed, and that consequently a large part of the fat, even more than 90 per cent., may be discharged unabsorbed. If all the bile passes into the bowel and the pancreatic juice is prevented from doing so, the stools, as Claude Bernard and Walker have shown, are colourless, probably because of the large amount of undigested fat which they contain. No better example of the value of Cammidge's methods could be found than in the record of the following case:

J. D., male, 50. Complains of jaundice of great intensity. Until nearly the end of July was quite well; at that time began to suffer from flatulence and distension after food. Pain never acute or colicky; no vomiting. Occasionally periods of relief for a few days, but the attacks continued to return until six weeks ago, when he became jaundiced. Since then pain has been absent, but jaundice has gradually deepened. There has been no pyrexia, no rigors, nor does he think the jaundice has lessened in intensity. Has lost 2 st. in weight.

State on Examination.—The liver is felt to be enlarged, and is smooth and regular. The gall bladder can be indistinctly felt; it does not project far beyond the liver border. Just above the umbilicus an indistinct mass was felt on one occasion which suggested an enlarged pancreas.

The Urine and Faeces (Report by Dr. Helen G. Stewart).—A well-marked pancreatic reaction in the urine points to some degree of chronic pancreatitis, which is confirmed by examination of faeces. There is a high percentage of total fats, of which nearly half are combined fatty acids, indicating that although the pancreas is affected, occlusion of the pancreatic duct is not complete, and the obstruction to the common bile duct must be above its junction with the pancreatic. That obstruction of the common duct is almost complete is shown by the presence of only a trace of stercobilin in the faeces; but the absence of undigested matter in the faeces also supports the conclusion that the primary site of the disease is in the common bile duct and not in the pancreas.

Diagnosis.—The case was diagnosed as one of obstruction of the common bile duct at a point above the bile papilla from some other cause than carcinoma of the pancreas.

Operation, October 13th, 1908.—The liver was enlarged and gall bladder much distended with thickened walls, although it did not project beyond the lesser margin for more than a short distance. Common duct dilated as far as upper margin of duodenum. There was an indurated scar in the duodenal wall which involved the duct and compressed it to complete obstruction. The scar was adherent to and seemed to involve the adjacent part (only) of the head of the pancreas. No tumour of the head of the pancreas. No calculi palpable. Gall bladder aspirated and found to contain clear mucus only. It was decided to perform a cholecystenterostomy. The duodenum could not be brought up to the gall bladder without dangerous tension, and so the anastomosis was made between the gall bladder and transverse colon. Wound closed.

The patient was sent by Dr. Dunderdale (Blackpool), who reports in March, 1909: "He is somewhat sallow, his appetite is good, and he has gained 2 st. since the operation. Between December 28th, 1908, and January 5th, 1909, had three attacks of colicky pain over the gall bladder region, followed by elevation of temperature and jaundice lasting three or four days. He now appears to be quite free from all his former inconvenience. The urine contains no bile. The pancreatic reaction has almost disappeared."

Selection of Cases for Operation.

The selection of the cases suitable to operation depends exclusively upon the accuracy with which a diagnosis can be made. The conditions most commonly met with are carcinoma of the pancreas, chronic pancreatitis, and gall stones impacted in the common ducts.

In carcinoma of the head of the pancreas the first type of jaundice with insidious onset, and finally becoming absolute, is characteristic. The gall bladder is constantly palpable, petechial haemorrhages or even large subcutaneous effusions of blood occur, and rapid and severe wasting, loss of appetite and all energy, and anaemia are constant features. The pulse, as a rule, is slow; the itching of the skin intolerable; ascites with oedema of the legs and abdomen comes at the last. When the urine is examined, the "pancreatic" reaction indicative of an inflammatory change is absent in the great majority of cases; in the minority it is found, and in them it is probably always the case that, in addition to the carcinomatous deposit, an inflammatory condition in the parts of the gland immediately adjacent has recently developed. The faeces very rarely show any evidence of stercobilin. This is due to the fact that it is not usual for a case to be submitted for examination in the early stages, when the compression of the common duct is slight. In the later stages, when no drop of bile can pass through into the intestine, the stercobilin reaction cannot of course be obtained. In cases of incomplete obstruction of the duct by a stone, the presence of stercobilin, though possibly in very small quantities, is constant.

Chronic pancreatitis is, of course, most often found in association with cholelithiasis, and usually with, or sequent upon, the presence of a stone in the common duct. It is now well known that the effect—chronic inflammation of the pancreas—may long survive the cause—a gall stone—but it is not so generally recognized that the inflammation of the gland may progress insidiously even though the irritant which initiated it has been removed. So, finally, the pancreas is sclerosed, and diabetes may result. The recognition of the presence of gall stones at an early stage and their removal is, therefore, the surest means of preventing the development of chronic inflammation of the pancreas. There are clinically two types of chronic pancreatitis; in the first the symptoms and signs approximate to those of carcinoma of the pancreas; in the second, to those of intermittent calculous obstruction of the duct. In the former the jaundice is sometimes very deep, but is rarely complete or unremitting. The tinge may vary in depth, even during the course of a single day, or may ebb and flow so slightly as just to be recognized. The gall bladder is then distended by bile, not by mucus. The faeces are abundant, frequent, soft, and greyish-white in colour, and greasy in appearance by reason of the great excess of neutral fat which is undigested and unabsorbed. Stercobilin is present, and the urine gives the Cammidge reaction. The duration of the disease and the absence of the extreme cachexia help to distinguish the simple from the cancerous condition.

In the second form there are the varying jaundice, the occasional rigors and sweating, the rapid elevations and depressions of temperature which characterize a case of chronic obstruction of the common bile duct; but all these things seem rather less in degree. Pain is not severe, and is rather a sense of epigastric oppression and uneasiness than an acute agonizing colic.

In cases of acute calculous obstruction of the common bile duct, a difficulty of differentiation from carcinoma of the pancreas may well be experienced, for the jaundice is deep and progressive in both. The history, however, gives the surest clue. With few exceptions, pain is absent in carcinoma, and is present in high degree before the onset of jaundice due to a stone. In the former the jaundice appears insidiously, in the latter rapidly. A stone does not lie long in the duct, however, before secondary changes appear; the duct dilates, and the stone comes to fit loosely. Then appear the signs so characteristic of the "floating" stone—attacks of severe epigastric pain of a colicky character, rigors, "steeple" elevations of temperature, and the rapid transient deepening of a jaundice which never entirely clears away. The gall bladder is contracted as a result of many old attacks of cholecystitis, and is therefore never, or very rarely, palpable. Wasting is often extreme; in one of my cases there was a loss of 12 st. in weight—from 22 st. to 10 st. Within six months of operation 7 st. of this loss were recovered. The liver is almost always enlarged, and is especially so immediately after an attack of pain. It is smooth, and there are no irregularities upon its surface. In the intervals of the attacks of pain the patient often feels well and may gain a little in weight; constipation is usually present at all times. A point upon which stress has been laid as distinguishing gall-stone impaction from chronic pancreatitis is that in the former the radiating pain is to the right, in the latter to the left. I have not found that any reliance can be placed upon this.

When carcinoma affects the hepatic or common bile ducts, or the ampulla of Vater, the symptoms strongly resemble those due to cancer of the head of the pancreas.

There is, however, a possibility of making an accurate diagnosis by giving attention to the history, and by making use of Cammidge's methods. The history points more frequently to gall-stone disease; in carcinoma of the pancreas, as I have seen it, a history of cholelithiasis is very rare, nor are stones found in the ducts or in the gall bladder at operation or autopsy. In cancer of the larger bile ducts, stones are found, though by no means so frequently as in cancer of the gall bladder. Rolleston found stones present in 23 out of 62 cases of primary carcinoma

of the bile ducts. In both cancer of the pancreas and cancer of the common bile duct the gall bladder is usually distended. Devic and Gallavardin in 18 cases of primary carcinoma of the common duct found that the gall bladder was enlarged in 17. The examination of the urine and faeces should enable a diagnosis to be made if the growth in the ducts is above the papilla, for the canal of Wirsung is then free, and the pancreatic juice can flow unimpeded into the intestine. The "pancreatic reaction" is negative, no stercobilin is present.

Simple stricture of the common hepatic or common bile duct may result from the healing of an ulcer due to a gall stone, as in a case of my own, or it may occur independently of gall stones as a sequence to typhoid or other infection. In my case, a diagnosis of obstruction of the duct, due possibly to stricture following on old calculous obstruction, was made upon the history alone.[1]

Operative Procedure.

The operations practised for obstructive jaundice are concerned either with the direct removal of the impediment, or with the making of an alternative path for the bile, or in certain cases with prolonged drainage of the bladder and ducts.

The following are the procedures:

A. *Removal of the Obstruction.*—(*a*) Choledochotomy; (*b*) Choledochectomy; (*c*) Choledochoplasty.

B. *Short-circuiting Operations.*—(*a*) Cholecystenterostomy; (*b*) Hepatico-duodenostomy; (*c*) Cystico-duodenostomy; (*d*) Choledocho-duodenostomy; (*e*) Hepato-cholangio-duodenostomy.

C. *Drainage Operations.*—(*a*) Cholecystostomy; (*b*) Choledochostomy.

In cases of prolonged jaundice a tendency to haemorrhage has been noticed. Petechial haemorrhages or even large effusions of blood beneath the skin may occur. During an operation every smallest vessel may ooze continuously, and after the wound has been closed bleeding may go on quietly between the stitches, or haemorrhage may occur within the abdomen near to, or at some distance from, the parietal incision. There are those who believe that the haemorrhage is more likely to occur, and is of more significance if the pancreas is involved, but I have not been convinced that there is evidence for this belief. In some cases of prolonged biliary obstruction the coagulation time of the blood may be lengthened, but this is not often or even usually the case, and I have known it to be shortened. But of the tendency to haemorrhage in a few cases, whatever the coagulation time may be, there can be no doubt. And the question at once arises as to whether anything can be done to forestall or counteract this. A. E. Wright suggested many years ago that calcium chloride would increase the coagulability of the blood, and Mayo Robson and others have consistently advocated the use of the salt, and have quoted cases in which they believed it to have been of value. My own view is that no good comes of its use; the evidence seems insufficient. It is well known that the coagulation of the blood in any species is greatly accelerated by the injection of an alien serum, and upon this fact I have based the practice of injecting sterilized horse serum (diphtheria antitoxin will do in an emergency) before operation upon jaundiced patients. It may be coincidental, but it is true, that since doing so haemorrhage has not occurred in any case of mine (the effect of the serum was marked in the case of a "bleeder" who had had two teeth extracted and had bled almost to death). J. C. Munro[2] has administered fresh rabbit serum in doses of 30 c.cm. subcutaneously twenty-four hours before operation in 15 or 20 patients, some of whom were purpuric, without seeing "the least tendency to oozing except in one or two instances, when it was checked at once by the use of more serum." Further experience of the use of these alien serum injections is necessary before their real worth can be estimated; but, so far as I have been able to see, I think that they are the most reliable of all methods.

1. *Operations concerned with the Removal of the Obstruction.*—These are now, as a rule, easily performed, and the results, both immediate and remote, are very satisfactory. The position of the patient, the back being arched over a cushion placed behind the liver, and the upward and outward displacement of the right lobe of the liver make the approach to the common duct very much easier. The bile in the common duct is usually infected; in more than half the cases a culture of an organism can be obtained; it is therefore necessary to protect all parts within the abdomen and the abdominal wall also from infection. The duct may be exposed by the free separation of all adhesions around and about it, or, if the patient's condition be very poor, by the method of "rotation of the duct" which I have described elsewhere. The duct being opened and to all appearance cleared of obstruction, the finger must be introduced to explore the interior, for in no other way can it be made certain that all stones have been removed. The duct should always be drained by a tube which passes upwards to the hepatic duct; it is never prudent to attempt its complete closure by suture. The gall bladder also may be drained; it is never wise to remove it in these cases unless it is useless or diseased beyond power of recovery. The results of choledochotomy followed by drainage are most satisfactory. The mortality is now about 5 per cent., and the after-history is almost always free from incident. I have only once had to operate a second time on a patient whose common duct had been opened and drained, by myself, for calculous obstruction.

2. *Short-circuiting Operations.*—In malignant disease of the head of the pancreas, for example, short-circuiting operations are hardly justifiable in the average case. Every aspect of the case is unfavourable. The patient is ill, wasted, extremely feeble; his blood condition is bad, and the tendency to haemorrhage is remarkable; the relief obtained by operation, of whatever kind, is slight, and does not justify the desperate risk.

The one distressing symptom which urges the patient to cry for relief is itching of the skin. This is an intolerable torment. To give some ease to it by any outward application is, I believe, almost impossible. The surgeon may therefore be persuaded to attempt relief by cholecystostomy or by cholecystenterostomy. The former operation I have several times done under eucaine or novocain anaesthesia. The gall bladder is large, and the operation rapid and easy. The relief occasionally is considerable, though it may be many days before bile begins to flow freely, the functions of the liver have been so long suppressed. Cholecystenterostomy for these cases is a dangerous operation; its mortality would appear to be near to 75 per cent., almost prohibitive. But if the disease is recognized early, and the patient's condition be otherwise favourable for operation, a rare case for surgical treatment may be encountered. The relief then (in no more than three cases of my own) is great, and the awful distress, inevitable if jaundice develops deeply, may be entirely avoided. Some faint tinge of yellowness, however, remains in the skin, but the itching, even when felt, is never unbearable.

The operation of cholecystenterostomy finds its most suitable application in cases where the obstruction of the duct is considerable, likely to be permanent, and is of a non-malignant character. Chronic pancreatitis is certainly the disease most often needing this relief. But here a word of warning is needed. The range and the rôle of chronic pancreatitis must not be unduly enlarged. It is a very real disease, but it is not to be diagnosed in any rough and haphazard manner. I have known cases in which large stones were present in the lower part of the common duct treated by a short-circuiting operation, the concomitant enlargement and induration of the head of the pancreas being then attributed to chronic inflammation. A very sufficient examination of the common duct is necessary before the presence of stones can be excluded, and a preliminary examination of the urine and faeces must have been made in most cases before a diagnosis of pancreatitis can be confidently established. In the great majority of instances chronic pancreatitis is almost a negligible complication of cholelithiasis. The treatment of the gall bladder or of the ducts will then suffice to relieve the lesion in the pancreas, which is secondary. The drainage for two or three weeks of the bile passages is all that is needed. But there are cases in which long after the stones have passed the pancreatic inflammation endures, and in such cases an anastomosis between the gall bladder, which is often distended, and the duodenum may alone be competent to give relief. In my own work I look upon the need for cholecystenterostomy as very

[1] British Medical Journal, 1905, vol. ii, p. 1390.
[2] *Boston Med. and Surg. Journal*, 1909, March 25th, p. 363.

restricted, partly because the great majority of cases are equally well treated by less serious means, partly because I am doubtful of the permanence of the drainage by a short circuit in the absence of complete obstruction, and partly because I do not feel sure that in some cases an escape of organisms from the intestine to the bile passages may not occur. This last objection is, of course, reduced to the smallest proportion if the duodenum is selected for the anastomosis; unhappily this is not always possible, the jejunum or even the colon being sometimes more accessible. The operation is one, therefore, of restricted use; it finds its surest application in the obstructions which are complete and permanent, and it is most aptly applied when the duodenum is accessible for the anastomosis.

The operations by which the main bile channels are anastomosed to the intestine (hepatico-duodenostomy, cystico-duodenostomy, and choledocho-duodenostomy) are rarely necessary. They are performed either after the removal of a stricture (simple or malignant) of the ducts or when operation defects are present. Dr. W. J. Mayo has demonstrated the best methods of their performance and the chief indication for their employment.

DISCUSSION.

Sir THOMAS MYLES (Dublin) said: I should like to endorse Mr. Moynihan's words as to the imperative necessity for prolonged and exhaustive clinical examination before operation. Some twenty-six years ago I did the first successful operation for obstructive jaundice in Ireland; it was a simple cholecystotomy, and would now be looked upon as a very ordinary procedure, but at the time I was called over the coals severely for my "wild-cat" surgery. The case is chiefly memorable now for the size of the ventral hernia that developed in the scar. It seems to me that the difficulties of diagnosis cannot be exaggerated, and whatever may be the truth of Courvoisier's law, I cannot help calling to mind the much older dictum that "there is no clinical law worth remembering." In the first place it is not always easy by any means to solve the problem as to the existence of a distended gall bladder. In fact, paradox though it may sound, the larger the gall bladder, the more difficult its recognition, and when it exceeds a certain size, diagnosis becomes impossible. I remember a case in which there was a history of gall-stone colic, but in which I could find evidence of nothing but a dilated stomach and a floating kidney; there was no jaundice, but the gall bladder was found in the pelvis. It appears to me that Irish surgeons have hitherto paid somewhat scant attention to clinical pathology, but after what has been said by the opener of the discussion the importance of the chemical side of these investigations is not likely to be overlooked. As regards operative treatment, I am of opinion that removal of the gall bladder should be avoided when possible; one objection is that it precludes subsequent free drainage of the ducts as a measure for the amelioration of symptoms, if that should unhappily become necessary. I should like to record a case in which all the symptoms of chronic pancreatitis were relieved by a gastro-enterostomy which previous drainage of the biliary tract had failed to improve, and I should be glad to hear some explanation of the circumstance.

Mr. STANMORE BISHOP (Birmingham) said: I have found Murphy's sign of great value in assisting me to a diagnosis of cholecystitis which is the essential element in biliary lithiasis. It enables the clinician to distinguish between renal, duodenal, and biliary inflammations. The method of injections with rabbit's serum is new, and, whilst extremely welcome, I am bound to testify to the great benefit I have obtained from calcium chloride; I have been in the habit of giving large doses, ½ drachm three times a day, and 40 or 50 grains per rectum as well. Before using this I had many consecutive cases of haemorrhage; since using it, none. I wish to emphasize the necessity of union of the gall bladder to the small intestine, and under no circumstances to the colon.

Mr. W. I. DE COURCY WHEELER (Dublin) said: For the benefit of those whose work is not specially surgery, it should be emphasized that obstructive jaundice is a late and avoidable complication of such common lesions as pancreatic inflammations and malignant disease, gall stones, cicatricial contraction after duodenal ulcers, floating kidneys and more rarely floating spleen, and its prevention would be accomplished by early diagnosis of these conditions. Examination of the urine and faeces is very important; iodine has been absent from the urine after administration of Sahli's iodoform capsule in my cases and present in other patients used as "controls" in the neighbouring wards. Clay coloured stools are due less to the absence of bile than to the presence of undigested fat. In an unusual case of gall-bladder disease in an old woman, simulating chronic intestinal obstruction from malignant disease, I found the ascending colon was pressed upon by a greatly enlarged gall bladder tilted backwards and firmly adherent to the ascending colon. The tumour was fixed, and could be felt in the right iliac fossa; loss of weight, vomiting, and alternate constipation and diarrhoea were the marked symptoms. Forcible peristalsis was most noticeable through the abdominal wall. The patient was cured by cholecystectomy. I should like to lay stress on the importance of removal of gall stones before an endless chain of pathological lesions is produced, especially since early operation with drainage of the gall bladder is perfectly safe.

Mr. C. P. CHILDE (Southsea) said: Obstructive jaundice embraces many other varieties besides that due to gall stones. As, however, jaundice due directly or remotely to gall stones is the most common and the most important surgically, and as my own experience, in common probably with that of most surgeons, has been chiefly in connexion with jaundice from this cause, I shall confine the few remarks I have to make to it. When I read the title of the subject selected for discussion, it seemed to me that it would not be outside its scope to include the preventive surgical treatment of obstructive jaundice, as this is clearly of the first importance. It is in the gall bladder that gall stones are known to have almost exclusive origin. They give rise to obstructive jaundice usually by passing from their site of origin in the gall bladder into the common duct and directly blocking it, less frequently by exciting pressure on the common duct owing to their presence in the cystic duct, or by causing localized peritonitis round the common duct and compressing or kinking it, or by giving rise to ulceration of the common duct and subsequent stricture in it, or by inducing malignant disease somewhere in the bile channels, or lastly by inciting disease in a neighbouring organ, the pancreas. In whatever way gall stones cause obstructive jaundice, this sign is a late result of their presence, and the ideal operative treatment of obstructive jaundice is the anticipatory or preventive treatment, and the proper selection of cases entails the early recognition of gall stones while they are still in the gall bladder and their surgical treatment there. For the operation of removal of stones from the gall bladder and even of the gall bladder itself is, as a rule, a simple and safe one, accompanied by a very low mortality, whereas operations upon the deep ducts are frequently severe and difficult, and, even in the hands of those who have had altogether exceptional opportunities in this department of surgery, are followed by a considerably higher mortality. With the view of attaining this most desirable object, the prevention of obstructive jaundice due to gall stones, medical education and advancement are, I think, required in two directions. The first is the general recognition of the many dangers of gall stones. It used to be confidently taught that gall stones in the gall bladder gave rise to no symptoms, and were not generally dangerous to life. Maxims of this kind die hard, and the one in question is no exception to the rule. But since during the past decade gall stones in the gall bladder have been withdrawn from their comparatively unimportant and obscure position by the attention of modern surgery, those who are in the habit of witnessing within the abdomen their consequences will be forced to admit what dangerous intruders they are, and to advocate their removal at the earliest possible moment. My experience of operations for gall stones is limited to about 50 cases, yet in this comparatively small series I have witnessed some striking illustrations of their dangers. Obstructive jaundice is only one of their ultimate results. There are many others, as the following cases show:

In 1902, a lady suffered from attacks of pain in the upper abdomen, accompanied with sickness, so-called functional indigestion, in reality no doubt due to gall stones in the gall bladder. Six months later she had pain, sickness and jaundice. A year after her first symptoms she passed twenty-six stones during an attack. A year later she again passed stones. Towards the latter end of 1904, that is, two and a half years after her first symptoms, she commenced to experience constant uneasiness in the gall bladder region. Early in 1905 she was first submitted to surgical treatment. At operation malignant disease was found in the gall bladder along with gall stones, and secondary nodules were present in the liver. A microscopical report of one of the secondary nodules confirmed the demonstration at operation that her cancer had originated in the gall bladder.

There can be no doubt that the original disease was gall stones in the gall bladder, the second phase obstructive jaundice, the final catastrophe cancer of the gall bladder. The preventive treatment—cholecystostomy or cholecystectomy—in 1902 would almost certainly have obviated the subsequent disaster.

A second patient, aged 44 years, had for many years suffered from attacks of epigastric pain and sickness. I had myself seen her in 1897 or 1898 in one of these attacks, and had told her she had gall stones. Matters were not so advanced in the treatment of gall stones at that date as they are to-day, and I did not advise surgical interference.

In 1905—that is, seven years afterwards—she had one of her usual attacks, accompanied with dragging pain. Three weeks after this she was suddenly seized with intestinal obstruction. Tenderness was present in the right iliac fossa. Abdominal section revealed a large gall stone impacted at the ileo-caecal orifice. This I extracted by an incision in the bowel.

She had a narrow escape, and made a fortunate recovery. The removal of this stone years before from the gall bladder would have saved her a dangerous illness.

A third patient had for many years suffered from gall-stone attacks, which had been diagnosed. In October, 1907, the acute abdomen supervened. I saw him in consultation within forty-eight hours. Immediate operation revealed a ruptured gall bladder, and the peritoneal cavity full of infective bile. The patient's condition on the table precluded any further procedure than drainage, and he died in twenty-four hours. There is no doubt that at any time during many years this catastrophe could have been prevented by a simple operation.

A fourth patient had for six years suffered from attacks of pain and vomiting, followed by tenderness over the gall bladder. In August, 1909, she was seized with one of these attacks, which did not pass off in the usual way. I saw her four days afterwards. Her temperature was 102.6°, her tongue dry, her general condition bordering on typhoid. A very tender swelling was discovered in the region of the gall bladder. Immediate operation revealed an acutely inflamed gall bladder full of stinking pus, its walls in parts gangrenous, and a stone impacted in the cystic duct. Cholecystectomy was fortunately followed by recovery, but cholecystostomy, or cholecystectomy, at any time during the preceding six years was the proper treatment.

The above four cases—carcinoma of the gall bladder following gall stones, acute intestinal obstruction consequent on the ulceration of a gall stone from the gall bladder directly into the intestine, rupture of the gall bladder, and acute gangrene of the gall bladder—occurring in a series of but 50 cases, sufficiently illustrate the dangers to which patients the subjects of this disease are liable without stones ever reaching the common duct at all, and drawing attention to their presence by the production of obstructive jaundice. I now pass, in the same series, to cases in which stones had escaped from the gall bladder into the common duct and caused obstructive jaundice.

In this series two patients died of shock after very severe operations. One of them gave a history of gall stones extending over seven years, and for five years had been suffering continually from attacks of obstructive jaundice and the passage of stones by the bowel. She was very stout, a confirmed invalid from her constant illnesses and suffering, and a bad subject for a severe operation. Three stones were removed from her gall bladder and eight from her common duct. The other had a five years' history of stones in the gall bladder and a six months' history of stones in the common duct with obstructive jaundice. The gall bladder was full of pus, a stone was present in the cystic duct, and one in the common duct. The stones and gall bladder were removed, and the common duct was drained through the stump of the cystic duct. A third patient died of repeated attacks of secondary haemorrhage, in whom eleven stones were removed from the gall bladder and four from the common duct. She gave a six years' history of gall stones in the gall bladder and common duct, and was deeply jaundiced at the time of operation. I may mention incidentally that she was put on full doses of calcium chloride before operation and continued to take it till her death, fourteen days afterwards. It did not, apparently have the slightest effect in checking the haemorrhage. Lastly, two deaths occurred in old women, close on 70 years of age, both suffering at the time from acute cholangitis, with rigors, high temperature, sweating, and jaundice. In neither of them was recovery expected from operation, but an attempt to check an otherwise obviously fatal illness seemed justifiable. In one, stones were removed from the gall bladder and a large one from the common duct. Drainage of the gall bladder and common duct were provided, and, although the temperature fell, the rigors ceased, and the jaundice was rapidly clearing, she died of exhaustion on the fifth day. In the other case the gall bladder was full of stinking pus, adhesions were numerous, and a stone was thought to be felt impacted in the cystic duct. The patient, however, was so ill on the table that it was impossible to do more than drain the gall bladder. She died of exhaustion some days afterwards. Both of these cases gave histories of gall-stone attacks previous to their fatal illnesses.

The cases I have narrated well illustrate the dangers to which patients are liable, either from a prolonged sojourn of stones in the gall bladder or subsequently owing to their presence in the common duct. They illustrate also that the dangers are of two distinct kinds. There are, first of all, those dependent on the complications which have arisen. In these cases, if death occurs after operation, the operation, though frequently credited with it, is not the cause of death, but simply fails to save life—a totally different thing. The deaths, for instance, following operation for rupture of the gall bladder and acute suppurative cholangitis belong to this category. But they also illustrate another point, which is that the operative dangers themselves are greatly increased in old cases where stones have long inhabited the common duct. This point is exemplified in the two cases that died of shock after very severe operations in patients worn out by long and painful illness, and in the fatal case of secondary haemorrhage after operation in a case of prolonged jaundice. On the other hand, the results of my operations for early gall stones are in marked contrast, for in a series of between 30 and 40 cases of cholecystostomy, with removal of stones and drainage of the gall bladder, I have no mortality to record at all.

It should be universally recognized, in the interest of our patients, that gall stones are among the most serious of abdominal diseases. Indeed, I know of no other disease within the abdomen in which danger threatens from so many quarters and in so many different ways. If it be established, then, that gall stones are exceedingly dangerous to life and should be removed as soon as diagnosed, the second matter requiring revision is the symptoms of gall stones. There are two symptoms commonly associated with gall stones to the almost total exclusion of all others. These are gall-stone colic and jaundice. If obstructive jaundice and the many other dangers of gall stones are to be surgically anticipated, it will be necessary in the future to relegate these symptoms to a subordinate position. First, with regard to jaundice. It cannot be too forcibly emphasized that obstructive jaundice is a terminal symptom of gall stones, and evidence that the most favourable time for their removal has escaped. Of 19 cases of stones removed from the common duct, in only two was the first evidence of gall-stone disease accompanied with jaundice, and in only two others did jaundice occur within the first year of definite symptoms. The remaining 15 gave unmistakable histories of stones in the gall bladder before the onset of jaundice for the following periods: 1 for one year, 1 for between two and three years, 2 for six years, 1 for seven years, 2 for ten years, 2 for twelve years, 1 for fourteen years, 1 for sixteen years, and 1 for many years (time not stated). Jaundice is therefore a terminal symptom, generally first appearing after many years of illness. With regard to gall-stone colic, it is an important symptom when present, but its absence is not of much value, and it is, in my experience, not very common.

I have carefully analysed the histories of 33 cases of gall stones under my care, which were diagnosed as such, and in which the diagnosis was proved correct by operation, with the view of ascertaining the frequency of the occurrence of gall-stone colic. I find that only 10 had certainly had such attacks. In 3 it was doubtful from their description whether the attacks were definite colic, and 19 had never suffered from true colic. Definite gall-stone colic occurred, therefore, in only about one-third of these cases. It follows that obstructive jaundice and colic are not the symptoms on which attention should be riveted in the

diagnosis of gall stones. On a further analysis of these 33 cases I find that no less than 25 of them had suffered from repeated attacks of pain in the upper abdomen, accompanied with flatulence and vomiting, and followed by tenderness in the right hypochondrium; 7 had suffered from similar attacks without vomiting. Only one had felt slight uneasiness, and, soon after, herself discovered a tumour. These patients had generally been supposed to be suffering from that omnigenous complaint, indigestion.

Attacks of pain in the upper abdomen usually followed, occasionally preceded, by vomiting, sometimes occurring without vomiting, coming on generally independently of food, and leaving tenderness anteriorly below the right rib border, are the points on which attention should be riveted in the diagnosis of gall stones.

Such symptoms, especially if found in women about mid-life, will as a rule warrant an operation for removal of stones in the gall bladder, a simple procedure attended with hardly any appreciable mortality, and will obviate the dangers to which I have drawn attention either from the prolonged sojourn of gall stones in the gall bladder or from their passage into the common duct. I have endeavoured in these remarks to emphasize the fact that the proper operative treatment of obstructive jaundice due to gall stones is preventive, and to be secured by an early recognition of the disease; and it follows that the proper selection of cases for operation is that of cases before stones have escaped from the gall bladder. Of course, in cases where gall stones give rise to no symptoms they cannot be diagnosed, but I am certain that the belief which has held so long, that gall stones in the gall bladder generally or frequently give rise to no symptoms, is a myth, due mainly to too rigid a concentration of attention on the symptoms of colic and jaundice. If these symptoms have not undue prominence in the diagnosis, gall stones will usually be found to give very unmistakable indications of their presence. The youngest patient on whom I have operated for gall stone was 22 years of age. She had had definite symptoms of gall stones for four years. Her gall bladder was enlarged and thickened, full of pus, and fifteen stones were removed from it; after which she made a good recovery. The oldest patient from whom I have removed stones from the gall bladder was 74. She was suffering intensely, and cholecystostomy was followed by complete recovery.

Dr. J. CRAWFORD RENTON (Glasgow) said: When are we to operate in cases of obstructive jaundice? When a patient has intense pain and vomiting, followed by jaundice, and, although the jaundice may be relieved, the probability is, if there are no stones passed, that they are in the gall bladder; and when, if the jaundice does not disappear after such a typical attack, it is probable that the stone or stones are in the common duct; in these circumstances most surgeons are agreed that an operation is absolutely necessary. The *x* rays have not as yet given us as much help in gall stones as they have given in renal and urethral stones, but I was glad to observe lately that Dr. Ironside Bruce had been successful in getting shadows of stones. I consequently, in the last three cases of gall stones, asked our radiographer, Dr. Somerville, to take photographs, and in one case slight shadows were obtained, and I have no doubt that we will soon be able to localize gall stones by the *x* rays. In the three cases above referred to we removed a large number of gall stones. Thanks to the labours of Mayo Robson and Cammidge, we have got a valuable test as an aid to diagnosis in connexion with gall stones and affections of the pancreas. Cases of gall stones are not quite so common in Scotland as in England, but a very fair proportion come under the care of most surgeons there. The number of gall stones in each patient varies considerably; we have had as few as one and as many as 600. The ages of the patients have varied from 19 to 70. After removing all the stones from the gall bladder and examining the ducts we always drain the gall bladder, fastening the tube with a purse-string suture in the way that Mayo Robson has recommended. We do not now stitch the gall bladder, but we sling it to the last stitch in the aponeurosis, in the way that the Mayos have recommended. The tube is drained into a glass bottle at the side of the patient. When there are stones in the common duct we remove the stones, draining the common duct also into a bottle. As a rule, patients are out of bed in a fortnight and able to return home. We have had several cases with pain and jaundice in which there were no stones but adhesions around the gall bladder. These were separated, and complete relief followed. There are cases which cause no pain but give rise to a certain amount of jaundice and enlargement of the liver, and in elderly people suggest malignant disease. Such cases should be explored, as in several I have found a large number of gall stones without malignant disease. In one lately we removed 110 gall stones, the patient's age being 62. There are other cases of chronic jaundice in which there is no evidence of any tumour or any enlargement of the liver, and where there has been no pain, and the patient sometimes looks so ill that even an exploratory incision seems unwise; the deep olive-green colour of the jaundice is very suggestive, and yet in several such cases improvement has taken place and the patients are well. Were these cases of chronic inflammation of the duct, or what were they? They occurred in elderly people, and malignancy was naturally suspected. I merely mention these cases in order that our prognosis may be given with caution, and that we may avoid saying that the patient has no chance of recovery.

Mr. A. B. MITCHELL (Belfast) said he should like to thank the introducer for the emphasis he laid on the necessity for accurate diagnosis, and the value of the work done by special workers in the laboratory. He must enter a plea for these gentlemen, for their material support by their professional brethren. Their assistance should be invited in every case where the slightest doubt exists, and adequate remuneration should be secured for them.

Professor SONNENBURG (Berlin), in illustration of the difficulties that might be encountered in diagnosis of acute icterus, mentioned a case in which the symptoms were due to acute yellow atrophy. It occurred in a patient after perfectly aseptic appendectomy, and, as the necropsy showed, was referable to the chloroform. The clinical appearances indicated an obstructive jaundice, but the rapid onset of coma aroused a suspicion of liver atrophy, and prevented operative interference.

Mr. W. MCADAM ECCLES (London) said: I am sure that we all wish that the cases of obstructive jaundice were as simple in diagnosis as Mr. Moynihan's remarks were clear in their expression, but unfortunately they are not. I should like to ask Mr. Moynihan's opinion as to the value, present or future, of *x*-ray examination. I agree that a small incision under a local anaesthetic, and the introduction of one finger ought to enable the surgeon to diagnose what should be done to relieve that most distressing symptom of intense itching. With regard to the use and value of calcium chloride, I think I can say that I have had success, for in the cases in which I have used it no bleeding has occurred. But there are three points in its use which must be observed: large doses, frequently repeated; given at least two days before operation; and the drug given per rectum.

Mr. B. G. A. MOYNIHAN, in reply, said the discussion had elicited one fact—namely, that the subject was full of interest and of difficulties. He was much interested in the divergent expression of opinion as to the value of calcium chloride. His own tests of coagulation time made him think it of no value whatever. Statements as to its value had to be taken on trust, as there was no experimental evidence in its support. He quite agreed that the surgeon ought not to be confronted with cases of obstructive jaundice; but it must be remembered that it was the business of the surgeon to discover the earliest symptoms, and not to rest content with looking out for textbook signs, which were generally those of late stages. Study of inaugural symptoms could be furthered by accurate observations on the organs when investigating the abdomen for any cause. The majority of the cases he had operated upon had never had jaundice, or at least anything but the slightest tinge. He did not wish to lay much stress on the value of the *x* rays in diagnosis. Routine use of the *x* rays tended to permit some laxity in the investigation of the clinical history, and there was too much inclination to put the responsibility of making a diagnosis on the radiographer.

SOME CASES OF RESECTION OF INTESTINE.

By G. P. Newbolt, M.B., F.R.C.S.,
Honorary Surgeon, Royal Southern Hospital, Liverpool, and Dean of the Clinical School.

Though the subject I have chosen is a well worn one, it still presents some points worthy of debate, and as far as my experience goes it is a rare thing even nowadays to get chances of operating upon early malignant disease of the intestine. During the last few years I have resected portions of intestine in 24 cases. Eleven of these operations were done on the small intestine, with 8 recoveries; in 7 of the 11 cases the resected intestine was gangrenous and contained in a hernial sac, and 6 recovered. They were all operated upon by enlarging the hernial opening and in no case was a median abdominal incision made. The table I hand round contains some details of my work, and all I propose doing now is to mention some points in connexion with the cases which I think may be of interest.

With regard to those involving the small intestine I feel sure that when the conditions for operation are favourable it is far safer to resect than to return gut the viability of which is uncertain. I have never regretted resecting gut, but I remember several cases in which resection would in all probability have saved my patient. End-to-end union is quickly and safely done, and there is not the fear of leakage which occurs in dealing with the large intestine. In my first five resections I used the Murphy button with four successes, and the scrotum of the case that died was full of faeces at the time of operation. I took the precaution of sewing over the button, thus making doubly secure. Latterly I have discarded all mechanical appliances but still carry the buttons in my operating bag for emergencies.

The question of treating these cases by means of an abdominal incision arises, and was advocated by Mr. Hutchinson, jun., in vol. xxxiii of the *Clinical Society's Transactions*, 1900; but I think, as a rule, one can get plenty of room by extending the hernial incision upwards and without the additional shock occasioned by a second incision into the abdomen. In cases of femoral hernia it may be more difficult to obtain room without seriously damaging the abdominal wall, but so far I have not found it necessary. The advantages gained are those of inspection of the abdominal contents and drainage of distended intestine if desired; the disadvantages, that the peritoneum may become soiled from the hernial region and the additional shock. Amongst the resections of small intestine, No. 7, a case of sarcoma involving the first part of the jejunum, is worthy of attention.

The patient was a male, aged 32, who had suffered from symptoms of dilated stomach for four months, and the physician in charge suggested that a gastro-enterostomy might be done to relieve him. A lump was present in the right iliac fossa, measuring 4 in. long by 1½ in. across, which seemed to move from side to side. An incision over the tumour in the right iliac fossa showed that there was a growth, some 4 in. long, involving the jejunum, high up, the small intestine and stomach above it being much dilated. The growth was freely excised and an end-to-end union done. The man made a good recovery from the operation, and I have not seen him since. The prognosis could hardly be good. The symptoms of vomiting, etc., were, of course, due to the partial obstruction caused by the growth.

My experience of intussusception is not large; in Case 9 the mass was gangrenous, and I excised it, doing an end-to-end union.

The child, aged 6 months, had been ill for three days before admission, and did not long survive operation. In Case 8 the boy was suffering from peritonitis at the time of operation; the volvulus was excised, together with the tuberculous gland, which apparently had caused the mischief. The gland was found torn open, and some caseous and purulent material had escaped. He died thirty-six hours after operation from shock and peritonitis.

The Nélaton's operation done in Case 6 was called for by the fact that there was acute obstruction, with enormous distension of the abdomen, and the conditions for operation in the house were most unfavourable. I therefore opened the most distended coil of small gut through a left inguinal incision. Later on, as clamping the spur failed, I opened the abdomen, excised the artificial anus, and did end-to-end union, with good result.

It is generally recognized that in cases of intestinal obstruction in which the cause is doubtful the median incision is the correct surgical procedure, and in the modern textbooks this statement is generally supported. In many instances, however, though the cause is doubtful, yet the chances are in favour of a certain region being affected. For instance, take the case of an elderly patient with indefinite symptoms of obstruction ending in an acute condition. The chances are that, with the well-known frequency of malignant growths in the sigmoid, an incision in the left ilio-lumbar region will give access to the disease. If it does, our operation is shortened and shock lessened.

But having adopted this plan when it seemed likely that there was a growth in the sigmoid, I found it did not answer. In the first case in which I used it the obstruction was in the hepatic flexure of the colon, and I had to make a right iliac incision to relieve matters. This entailed two incisions, and, although no worse off as regards this point, I had not the advantage of exploring the abdomen which a median incision gives. In Case 15 I made a left iliac incision, and then drained the caecum. Later on I explored the abdomen through a median incision in order to find out where the obstruction was, and, finally, I removed it through an incision in the right hypochondrium immediately over the growth itself. I now invariably make a median incision below the umbilicus, and, having found out where the obstruction is, proceed accordingly, unless the rectal examination, made whilst the patient is under the anaesthetic, reveals anything. Those who still object to rubber gloves will at least acknowledge that with them one can make this examination safely and without delaying subsequent operative technique.

In Case 14 I felt the growth per rectum, and by making an iliac incision removed it right away, tying in Paul's tubes. This patient was very ill at the time, and would not have stood a prolonged operation. This, to my mind, is the ideal method of treating obstruction caused by a growth of the large intestine which is operable. Other methods are the following: In malignant disease of the caecum, in which the diagnosis may be made early on account of a lump being felt, or because it is mistaken for a chronic appendicitis, operation is performed under favourable conditions, and after excision of the growth an immediate end-to-end union can be done. Case 24 is a good example of this. Union took place by first intention, and only one dressing was needed. In another case, in which the disease was more extensive, an infection of the wound took place. This delayed matters, but did not interfere with a good result.

I have already said the diagnosis of growths in the colon and sigmoid is usually made by the occurrence of obstruction—at least that is my experience—so that when operating we have quite a different condition of affairs to deal with. The gut is not in a condition to manipulate, it may not hold stitches, and it varies in calibre above and below the obstruction. The first indication, therefore, is to drain the distended gut, and this may be done in several ways.

The first stage in all operations in which the seat of obstruction is doubtful is the median incision below the umbilicus and the location of the disease causing the mischief. How apt one is to be mistaken is shown by Case 21, in which a man aged 32 was admitted with acute obstruction, the cause being a carcinoma of the sigmoid. About the same time an elderly man also came in, but though the cause seemed likely to be malignant, he had a hernia of the small intestine through a hole in the omentum—just the reverse of what one would have expected in the two cases. A year or two ago I explored the abdomens of two people, thinking that in all probability malignant disease was present, but I was agreeably mistaken. Bismuth radiographs were taken in one case, but the shadows given did not assist in the diagnosis. In one case, a male, there were adhesions tying down the transverse colon in several places, and in the other, a woman, the colon was partially obstructed by a mass of omentum binding it down. Both were cured by the operations. I can remember at least three cases in elderly men in my neighbourhood in which there were symptoms of obstruction which seemed likely to demand operative interference. Malignant disease was suspected in each

of these, but two of them yielded to treatment; the third died of carcinoma later on. The growth having been located through a median incision and obstruction being present, we have the choice of several methods of treatment:

A. A second incision is made over the growth; the latter is withdrawn from the abdomen, excised, and Paul's tubes tied in for drainage. The artificial anus is closed later on—a two-stage operation.

B. A colostomy is done on the proximal side of the growth through a second incision, and later on the growth is removed by reopening the median incision; later on the colostomy wound is closed—a three-stage operation of which No. 22 is an example.

C. A second incision is made over the growth, which is withdrawn and fixed outside the abdomen with a glass rod, and a colostomy opening made on its proximal side. Later on the growth and colostomy opening are excised and an end-to-end union done, leaving in a gauze drain—a two-stage operation, of which Cases 13 and 21 are examples.

Naturally the ideal method is Method A, as it needs only a subsequent closure of the artificial anus after cutting away the spur. The objection is that one cannot search for glands. It is the operation which was done in Case 14, only here, in consequence of my being able to feel the growth per rectum, the median incision was unnecessary.

In Method B the growth can be excised at a time suitable to the abdominal conditions—that is, when all distension has subsided and the patient's condition is good—we can then search for glands. In Case 22, at the first operation I was unable to get the growth out of the abdomen; at the second operation it was with the greatest difficulty that I could resect it, as the meso-sigmoid was so very short. In this case the small intestine was adherent and was also resected, but an examination later on did not reveal any malignant infiltration of its walls. One was able to feel the line of union in the sigmoid through the colostomy opening, and when it was secure the spur was cut away and the anus closed. Owing to the rather shortened condition of the gut the clamp tended to slip off the spur, but an ordinary pair of curved forceps did all that was necessary, and the man made a good recovery.

The third method, numbered C, is not quite satisfactory to my mind, as the wound is so liable to get infected from the colostomy. However, if drainage is ensured it is probably a safe method; I used it in Case 21. The point as to whether it is safe to do end-to-end union in the undistended colon arises; I think it is. Many prefer a lateral anastomosis. No doubt great care has to be taken at the meso-colic junction or one will get leakage.

In Case 19, where the growth was in the transverse colon, after draining the gut in the first instance, I reopened the abdomen, excised more bowel, and searched for enlarged glands. After excising the artificial anus I did an end-to-end union, and the result was good, though there was a slight wound infection.

In Case 23 I removed a growth of the sigmoid, solely with a view of relieving the great pain caused by the involvement of the anterior crural nerves. The woman was very thin and ill

CASES OF RESECTION.

Resection of Small Intestine (11 Cases).

No.	Initials and Age.	Sex.	Disease.	Date of Operation.	Nature of Operation.	Result.	Remarks.
1	B. G., 75	F.	Strangulated femoral hernia, L.	May 15, 1900	Resection of 6 in. of gut	Recovery	
2	P. C., 41	M.	Strangulated inguinal hernia, L.	Sept. 18, 1900	Resection of 8 in. of gut	Recovery	
3	E. M., 32	M.	Strangulated scrotal hernia, R.	Dec. 25, 1901	Resection of 12 in. of gut	Death	Five days' duration. Faeces in scrotum.
4	P. C., 63	M.	Strangulated femoral hernia, L.	Dec. 29, 1901	Resection of 6 in. of gut	Recovery	
5	E. I., 48	F.	Strangulated femoral hernia, L.	June 18, 1904	Resection of 6 in. of gut	Recovery	
6	R. W., 54	M.	Acute intestinal obstruction	July —, 1904 May 9, 1905	Nélaton's operation Resection of gut and excision of artificial anus	Recovery	Obstruction due to tuberculous peritonitis?
7	G. B., 32	M.	Sarcoma of jejunum	June 26, 1907	Gut and growth excised	Recovery	
8	B. C., 15	M.	Volvulus of jejunum, tuberculous gland	Sept. 25, 1907	Volvulus and gland excised—end-to-end anastomosis	Death	Shock and peritonitis.
9	R. T., 6 mo.	M.	Gangrenous intussusception	Nov. 14, 1907	Resection of intussusception	Death	Shock.
10	J. C., 57	M.	Strangulated inguinal hernia, L.	June 12, 1908	Resection of 10 in. of gut	Recovery	
11	W.H., 58	M	Sloughing gut in hernial sac, R.	Nov. 3, 1908	Resection of 12 in. of gut	Recovery	
			Resection of Large Intestine (13 Cases).				
12	E. G., 38	M.	Colloid Carcinoma of caecum	April 21, 1904	Excision of caecum	Recovery	Lived 1½ years. Secondary liver.
13	L. H., 53	F.	Carcinoma of sigmoid Acute obstruction	May 24, 1904 Sept. 1, 1904	Colotomy Excision of growth and artificial anus	Recovery	Lived 2 years. Secondary glands (abdominal).
14	P. McE., 51	M.	Carcinoma of sigmoid Acute obstruction	Dec. 1, 1906	Excision of growth; Paul's tubes and drainage; closure of artificial anus later	Recovery	Well 2 years later.
15	R. B., 63	M.	Carcinoma of hepatic flexure Acute obstruction	April 2, 1907 April 30, 1907	Left iliac excision; caecostomy Excision of growth in hepatic flexure later on	Death	Peritonitis.
16	J. H., 69	F.	Carcinoma of splenic flexure Acute obstruction	July 18, 1907	Excision of splenic growth; Paul's tubes	Death	Shock.
17	M. P., 25	F.	Colitis sinistra	Dec. 3, 1907 March 31, 1908 Nov. 10, 1908	Adhesions to ovary freed Excision of sigmoid Ovary excised and adhesions freed	Recovery	Well.
18	A. H., 53	M.	Carcinoma of caecum Lateral anastomosis done previously elsewhere	May 19, 1908	Caecum excised; lateral anastomosis enlarged three days later	Death	Peritonitis.
19	E. S., 40	F.	Carcinoma of transverse colon Perforation of growth	June 2, 1908 July 7, 1908	Excision of growth; Paul's tubes Abdomen drained; end-to-end union later	Recovery	Well.
20	? W., 60 ?	M.	Acute volvulus of caecum Acute obstruction	Sept., 1908	Excision of volvulus; Paul's tubes tied in	Death	
21	D. W., 32	M.	Carcinoma of sigmoid Acute obstruction	Nov. 24, 1908	Growth brought outside and colotomy done above it; excision of growth with anus and end-to-end union later	Recovery	Well.
22	D. W., 47	M.	Carcinoma of sigmoid Acute obstruction	March 28, 1909 April 13, 1909	Colotomy; left inguinal Excision of sigmoid growth; also piece of small gut	Recovery	Well.
23	E. G., 52	F.	Carcinoma of sigmoid	April 2nd, 1909	Excision of growth with end-to-end union	Recovery	Relieved.
24	E. H., 64	F.	Carcinoma of caecum	June 3rd, 1909	Excision of growth with end-to-end union	Recovery	Well.

and the operation was a hurried one. I drained posteriorly, and there was a slight fistula. I do not think this fistula would have occurred if I had had more time.

The opinion I have formed is that where one has plenty of gut to overlap a side-to-side union is desirable; but, if this is not so, end-to-end may be done, but the greatest accuracy in suturing is necessary, and it is safer to drain when in doubt.

Amongst the other cases classified I should like to call your attention to No. 19, in which there was a growth involving the lateral wall of the transverse colon which had perforated. The lower abdomen was full of semi-purulent fluid with a faecal odour.

The patient was a well-nourished woman, aged 40, and the mass lay in the left iliac region. It was excised and Paul's tubes tied in, the lower abdomen being cleared out and drained. She made a good recovery, and five weeks later I excised the artificial anus, searched for glands, and did an end-to-end union. My idea in performing this extensive operation was to remove another piece of gut with any enlarged glands which might be present, otherwise clamping the spur and closing the artificial anus would have sufficed.

Case 18 was unfortunate. Six months before I saw him he had a lateral anastomosis done for obstruction, but nothing further was suggested.

He came to me complaining of intense pain caused by the growth, so I excised the malignant caecum; at the same time I explored the lateral anastomosis, to be sure that it was patent, and on finding it was, closed my incision with sutures. Unfortunately, the lateral anastomosis kinked after removal of the growth, causing obstruction. An attempt to relieve this by enlarging the anastomotic opening failed and he died. An examination showed that there were no enlarged glands left and no secondary deposits, so that it was a favourable case for operation. There was some local peritonitis around the incision which I had made into the lateral anastomosis, due I think to a leak caused by the manipulation at the second operation.

A clean sweep of the growth and anastomosis at the first operation would probably have saved the man.

No. 17, a case of colitis sinistra, was interesting and obstinate as regards treatment.

The patient had a distended abdomen, with pain and attacks of semi-obstruction. I first tried to relieve the trouble by freeing adhesions between the lower sigmoid and the left ovary. There was a big loop of sigmoid, which was thickened and contracted in calibre. As the symptoms continued I reopened the wound, excised all the loose sigmoid, and did an end-to-end union of the descending colon and lower end of the sigmoid. She improved for a time, but relapsed, and I again operated. The left ovary was removed, all adhesions separated, and the raw surfaces covered with peritoneum. The union of the resected portion of gut was perfect and difficult to find.

Since this operation the girl has had comparatively good health. The portion of gut removed was contracted in parts from old ulceration. There were three pouches above the constrictions.

No. 20 was a case of much interest. The patient, an elderly farmer, had acute obstruction when I saw him. He was in poor condition, but with a fairly good pulse.

On opening his abdomen I found the caecum twisted on itself, occupying the left hypochondrium; it was enormously distended, and I had to withdraw it from the abdomen before it could be untwisted. As with the general distension there seemed to be no chance of returning it I excised it and tied Paul's tubes in the colon and ileum. The flow of faecal matter was good, and although the colon was damaged at the twisted point, it seemed as if the result would be good. However, he died four days later, but I could get no further details.

The remaining cases are all varieties of growth in the large gut, and call for no special comment. The points which seem to me worthy of discussion are the following:

1. The difficulty in the early diagnosis of malignant disease affecting the large intestine.
2. The best methods of uniting resected large intestine in the absence of obstruction.

Every one, I think, will agree that when obstruction is present preliminary drainage of the large intestine is essential.

DISCUSSION.

Sir Thomas Myles (Dublin) said that in his earlier days he used immediate resection of the gut in cases of gangrenous hernia, followed by immediate end-to-end anastomosis, but that he had now abandoned this method in favour of merely relieving the obstruction at a first operation, putting a tube into the gut if necessary. The point was that in the obstructive stage the infection had not yet spread to the peritoneum, which must be opened to perform resection. At a second operation this danger was no longer to be considered, and an incision should be made parallel to Poupart's ligament (he was speaking of femoral hernia more especially), and a side-to-side anastomosis be performed. He believed this form of anastomosis performed with Murphy's button was the quickest and safest, and had stood him in very good stead in difficult cases, such as one of acute volvulus of the caecum, in which the caecum had to be disentangled from beneath the whole of the small intestines.

Mr. McAdam Eccles (London) said that with regard to those interesting and important cases of strangulated hernia, and particularly femoral hernia, where gangrenous gut is found, he agreed with Mr. Newbolt that primary resection was the ideal operation, but it was not always possible. This, he thought, was performed most safely through a separate incision made above the site of a femoral hernia, but the peritoneal wound should always be drained, and thoroughly drained. With regard to the question of end-to-end or lateral anastomosis, he was sure lateral anastomosis was the safer method, particularly where the proximal portion of the gut was dilated in comparison to the distal.

Mr. G. A. Syme (Melbourne) said he was in favour of opening the abdomen and resecting the bowel from inside by lateral anastomosis in cases of gangrenous femoral hernia and draining the sac. In cases of caecal volvulus with gangrene he had resected the caecum and laterally implanted the end of the small intestine in the ascending colon, and with success.

Mr. A. B. Mitchell (Belfast) expressed a decided preference for lateral anastomosis. In performing this anastomosis he strongly urged the inserting of the second or through-and-through row of sutures before opening the lumen of the bowel, thus avoiding infection of the peritoneal edge by *B. coli*. Having inserted the usual continuous peritoneal line of sutures, he made an incision through the peritoneal and submucous coats, allowing the mucous membrane to project. The first half of the through-and-through line of stitches (preferably of catgut) was then inserted. The bowel was then opened, and this could be done without any danger of dividing the sutures already inserted. If necessary a fourth row of stitches might be applied to the mucous membrane. The junction was then completed in the usual way.

Mr. C. P. Childe (Southsea) referred to 7 cases of enterectomy which he had performed for gangrenous intestine—2 cases in umbilical and 5 in femoral hernia. He had in each case excised the intestine and performed lateral anastomosis in the wound, adopting drainage in all cases. He preferred lateral anastomosis in all cases in which it was mechanically possible. He referred to one case in which he had excised 8 ft. 6 in. with perfect immediate recovery, but followed after a few months by marasmus, with diarrhoea.

Mr. W. Thelwall Thomas (Liverpool) alluded to the necessity of considering intestinal anastomosis in two stages where acute obstruction was present, using local anaesthesia for an enterostomy (preferably with Paul's tube). End-to-end anastomosis, although ideal, was, in his opinion, rarely possible. In any given case one could hardly ever predict the exact operation which would be performed before the exploration; one had to be prepared to adopt any of the many known expedients or methods.

Mr. Newbolt, in reply, stated that in his case of volvulus of the caecum the small intestines lay over and bound down the twisted large intestine, as already described by Sir Thomas Myles. Personally he avoided dividing small intestine wherever possible, as he was not satisfied with the results of the proceeding. He considered a second abdominal incision unnecessary in the resection of gangrenous intestine. Though agreeing that lateral anastomosis was good, and the only available method when the calibre of the gut varied greatly, cases occurred, such as No. 22, in which end-to-end union only was possible.

PERFORATIVE DUODENAL ULCER.

By A. B. MITCHELL, M.B., F.R.C.S.I.,
Surgeon to the Victoria Hospital, Belfast, and the Ulster Hospital for Women and Children.

A PROLONGED search through the published records of perforative duodenal ulcer has convinced me that the best contribution I can make to the literature of this subject will be effected if I confine myself strictly to my own records and those of the Royal Victoria Hospital. I trust that in doing so I will be acquitted of any want of appreciation of the brilliant work done by surgeons in this field in all parts of the world. This paper, however, must be brief, and its scope must therefore be limited. The list I submit for your consideration is, as far as I know, complete, and I have to thank our surgical registrar, Dr. S. T. Irwin, and my house-surgeons, Dr. Sinton and Dr. Joy, for the trouble they have taken to collect and verify the cases.

It is of interest to note that in his classic work on *Diseases of the Intestines*, published in 1901, only eight years ago, Boas[1] refers to operations in duodenal perforation as follows:

> Operations for perforative peritonitis have been successfully performed in several quarters. In view of the absolutely hopeless prognosis of ulcer of the duodenum after perforation, surgical intervention should be undertaken as soon as possible—within ten to twelve hours at least after the diagnosis is assured, and the primary shock has been recovered from.

How different is the position to-day! How great the strides of surgical technique in these eight years! My entire list yields 28 cases, with only 3 deaths. That all the cases which fell to my own lot resulted in recovery is one of those happy accidents for which I claim no special credit, nor do I ever hope to be in a position to publish such another series. We all know how treacherous such cases are, and how the very case which seemed to be an ideal one for recovery unaccountably fails to respond to our assistance, and the shadow of death damps our hopes. If, however, we eliminate the first two cases in the supplemental series of operation at the Royal Victoria Hospital, which, as I shall point out later, were not under conditions fairly comparable with the others, we would have in this list 10 cases with only 1 death, which would give a total of 26 cases with 1 death. Arising out of these records, a few points are worthy of attention.

FREQUENCY OF DUODENAL ULCER.

The occurrence of perforation places beyond question the nature of the disease. Whatever doubt any one may have as to the pathological condition of a viscus on inspection at an ordinary operation, the finding of a perforation is decisive. That so many cases should have been met with in a limited area proves that duodenal ulcer, in our locality at least, must be a common disease. There is no reliable method of estimating the frequency with which these ulcers perforate, for we have no approximate idea of the number of such ulcers in the community. The list before you—32 cases, 28 operated upon, 4 moribund on admission to hospital—suggests that the perforation risk is a very great one; Boas[2] puts it at 69 per cent.

The signs of perforation are now so well known that it would be a waste of your valuable time to refer to them at any length; one or two points I feel bound to emphasize so constantly do they force themselves on my notice. In the first place, as the result of what, for want of a better term, I may call hereditary teaching, far too much weight is attached to what is known as "shock" as a symptom of perforation. How often are we told, "I do not think there is a perforation, there is no shock"! We could almost wish this word "shock" had never appeared in our textbooks.

In the early stage, when diagnosis is all-important, it is oftener absent than present, and if we are to reach the highest level of success in the treatment of perforation of the duodenum, stomach, or any viscus, this mythical shock must be relegated to its proper place, and a diagnosis made without regard to it. A pulse of 60 to 80 and of good volume is quite usual. To be deceived by it probably means the sacrifice of a life.

Sudden intense pain, associated with hardness and rigidity of the abdominal muscles, with characteristic peritoneal stillness, are the outstanding features of perforation.

If I were to select one sign in preference to all others I would, without hesitation, choose rigidity. The moment perforation occurs the watchful muscles promptly, suddenly, firmly contract, their object being to prevent further escape of visceral contents, to diminish extravasation, and thus limit the harm already done. This vital spasm, this watchful rigidity, is a trumpet call for help. It is never relaxed till, weary and worn with their useless vigil, or slumbering at their posts, drugged by opium, the muscles give up the unequal combat; distension supervenes, and toxic peritonitis claims another victim. You may hurry all the resources of modern science to the battlefield at this stage, but only a miracle can avert defeat.

There appears to be a general impression that duodenal perforation is more dangerous than gastric perforation. With this view I take the liberty of dissenting. The moment duodenal perforation takes place the pylorus contracts sharply and firmly, Nature instinctively doing all she can to prevent further harm, and so for a time after the initial discharge no further escape of stomach contents is permitted. A parallel to this is familiar to all of us, in the action of the sphincter of the bladder in cases of ruptured urethra. Dreading, as it does, the danger of extravasation of urine, the sphincter obstinately refuses to relax, even when the unfortunate victim is suffering the intolerable agony of a distended bladder. In perforation of the stomach, on the other hand, a gaping opening persists, through which the various potions, administered by anxious and well-meaning friends, pour freely into the general peritoneal cavity. This action of the sphincter is an additional reason for the avoidance of opium.

Further, if we consider that the duodenal contents are less likely to be septic than those of the stomach, and that the area of extravasation is bounded by well-defined limits, we might reasonably expect more favourable results from treatment, and our experience in this school fully supports this expectation. My own operative results in gastric perforation are not nearly so favourable as in duodenal. I now refer very briefly to a few points in connexion with operative treatment.

TREATMENT.

To operate, and operate at the earliest possible moment, is now universally recognized as the only intelligent treatment of perforation. It would be mere waste of time to submit figures or arguments in support of a principle so thoroughly established. Some points in the operative technique may, however, be referred to with advantage:

1. The incision is best made through the right rectus muscle, because if the ulcer is in the second portion, or surrounded by adhesions, a median incision involves unnecessary pulling and straining in order to reach the perforation.

2. The perforation having been found, should be rapidly closed by a purse-string or other form of suture at the choice of the operator; the exact method of suture does not appear to be a matter of much importance, but if possible the line of suture should be transverse, so as to diminish the risk of stricture. I do not think it either safe or sufficient to attempt closure of the opening by application of an omental patch.[3] Such a method leaves the ulcer untreated, whereas suture, by infolding the diseased area, offers some prospect of cure.

3. Having closed the ulcer, we proceed lightly to cleanse the area of extravasation by use of gauze sponges. This area has been shown by S. M. Smith[4] to be confined to the right side of the abdomen, little or no fluid escaping to the left of the ascending colon, the current being guided along the right side of the ascending colon, over the caecum and into the pelvis. Overflow into the general peritoneal cavity only occurs when the pelvis is full. It is therefore clear that to flush out the peritoneum is unwise, especially in an early case, as in this way you must inevitably soil a very large area of peritoneum which would otherwise escape infection. It is infinitely better not to cleanse at all than to cleanse too much. Personally I am doing less each time I operate, but I still have a hankering after mopping out any free fluid lying around the right kidney. It must, however, be borne in mind that the contents of the duodenum, having enjoyed a full course of gastric digestion, are fairly sterile and not so dangerous as would at first sight appear.

4. An incision, about 1 in. long, is made over the pubes, and a large glass drain inserted into the pelvis; from this a free escape of fluid at once occurs. It is surprising how much fluid is found in the pelvis even when there is apparently very little local extravasation.

5. Our next consideration is, Shall we perform gastro-jejunostomy? If the case has been operated on sufficiently early, and if the general condition warrant a little additional exposure, I do not hesitate to say Yes. Our list shows that it is reasonably safe, all of the 7 cases in which it was done having recovered. One of my cases required gastro-jejunostomy on the eighth day owing to dilatation of the stomach (Case XII). One had the operation performed within eighteen months owing to a similar condition (Case IV). One perforated a second time within eight months (Case X). Two at least now suffer from symptoms calling for gastro-jejunostomy. The advantages of immediate gastro-jejunostomy are very great. Mouth feeding can be carried out almost from the first; recovery is more rapid; the period of convalescence is diminished, and a complete cure may be guaranteed.

Drainage.

6. In many cases local drainage may be dispensed with. This, however, is a matter for individual judgement. Where any doubt exists, it is safer to drain. The best drain is a rubber tube with a gauze wick. Pelvic drainage is necessary in all but exceptional cases, and for this a glass tube into which a gauze wick is inserted is the most efficient. The tube should be removed not later than the third or fourth day. If there is any purulent discharge from the drainage opening, I find instillation of a solution of perhydrol (Merck) 1 in 10 or 12 by far the most effective treatment. A rubber catheter fitted with a small glass funnel is introduced into the bottom of the sinus, and the solution poured in. This is repeated once or twice daily.

7. On returning to bed the patient is at once propped up in the sitting position, and continuous administration of saline solution by the rectum set on foot.

This is the keystone of success. Indeed, I feel justified in asserting that no surgeon has any right to operate for perforation, either in the duodenum or elsewhere, who has not thoroughly mastered the principles underlying the continuous use of the rectal saline. A nurse who understands the process and who will not be satisfied unless she can get in at least 1 pint per hour is essential. If this is not done, then the mistake is in the administration.

I take this opportunity of paying my tribute of gratitude to Dr. J. B. Murphy for his advocacy of this method of treatment. I know of no therapeutic measure in recent years which has been the means of saving so many lives. Like many others, I at first doubted the reliability of his statement as to its efficacy in septic peritonitis. I have now humbly to apologize for my former want of faith.

It is interesting to note that of the 3 deaths in the list of cases I have submitted 2 occurred before we had regularly adopted this line of treatment in the Royal Victoria Hospital. If these were omitted, we should have 19 cases operated on in that institution (including those in my own list which were in hospital), with 1 death, and that in a case operated on thirty-six hours after perforation. The record speaks for itself. Further treatment is on ordinary, well-recognized lines.

In conclusion, I have to apologize for the fragmentary nature of my remarks, but I venture to hope, however, that this Belfast record may be of some service to the literature of perforative duodenal ulcer.

DETAILS OF CASES.

CASE I (*May 15th, 1904*).—W. P., aged 43. Had "a bad stomach" all his life. He suffered from attacks of painful indigestion lasting three to four weeks, followed by intervals of three to six months' comparative health; then another attack, and so on; during these attacks he never vomited, he never had melaena. Pain coming on two to three hours after food, and when at its height promptly relieved by food, was his most characteristic symptom. On May 15th, 1904, he suddenly perforated. Operation, undertaken at his own house eleven hours later, revealed an indurated duodenal ulcer, about half an inch below the pylorus. The ulcer was infolded and abdomen flushed out with saline and the pelvis drained. He made a good recovery, and is to-day in excellent health.

CASE II (*June 17th, 1905*).—James S., aged 49. Suffered from indigestion for many years. Had typical hunger pain, but rarely vomited. At 12.30 p.m. on June 17th, 1905, perforation occurred. He was admitted to hospital at 6.30 same day. Operation, seven hours after perforation, revealed a hole the size of a quill pen in the first portion of the duodenum. This was situated on the posterior aspect, half an inch below the pylorus, and was surrounded by a zone of induration the size of a shilling. Perforation closed, peritoneal cavity flushed out with about 8 gallons sterile water; pelvic drainage; good recovery.

CASE III (*March 4th, 1907*).—John W., aged 32. Victim of intermittent indigestion for ten years; hyperacidity; occasional vomiting; no haemorrhage. Perforation on March 4th, 1907. Operation, eight hours later, revealed a perforation on anterior wall of duodenum half an inch from the pylorus. Pyloric end of stomach and duodenum surrounded with inflammatory exudations and adhesions. Perforation closed; pelvic drainage. Recovery complicated by bronchitis. Left hospital in good health on April 4th, 1907, one month after operation.

CASE IV (*March 27th, 1907*).—Dr. I., aged 30; a prominent athlete. Intermittent "indigestion" since boyhood; typical hunger pain; never vomited; melaena for first time, January, 1907. Perforation March 27th, 1907. Operation, thirty-six hours later, revealed an indurated ulcer at junction of first and second portions of duodenum. Closure of perforation effected with great difficulty. Slow recovery. Required gastro-jejunostomy later on.

CASE V (*July 21st, 1907*).—John M'C., aged 43; publican, retired police constable. Never had the slightest pain or discomfort of any kind. Had been a steady drinker. Perforation at 10 p.m., July 21st, 1907. Promptly sent into hospital by Dr. Stevenson. Operation, four hours later, revealed a chronic indurated ulcer on first portion of duodenum. Perforation closed; pelvic drainage; rapid recovery.

CASE VI (*July 31st, 1907*).—Robert A., aged 38; clerk; patient of Dr. Williamson. Had been a dyspeptic for years, symptoms indicating gastric ulcer. Perforation on July 30th, 1907. Operation twelve hours later. Gastric ulcer a little above the pylorus. Indurated duodenal ulcer, which had perforated on anterior wall half an inch below the pyloric ring. Perforation closed; abdomen flushed with saline; pelvic drain. Recovery.

CASE VII (*September 15th, 1907*).—Robert L., aged 40; Crossgar. Indigestion of the intermittent type for over ten years. "Hunger pain" typical. Melaena on several occasions. Perforation September 14th, at 1 o'clock; operation twenty-five hours later. Perforation found on anterior surface of duodenum three-quarters of an inch below pylorus; sutured with difficulty; direct drainage and pelvic drainage. Recovery. In good health five months later.

CASE VIII (*November 15th, 1907*).—Robert F., aged 30. Had suffered from intermittent attacks of indigestion for eighteen years. During these attacks pain came on about two hours after food, and was always relieved by a full meal. Occasionally he noticed something in his motions which he took to be blood. He had no vomiting. At 11 a.m. on Friday, November 15th, 1907, whilst at business, he was suddenly seized with intense abdominal pain. He was sent into hospital at 11 a.m. on Sunday, 17th. He was then greatly collapsed, with a quick, feeble pulse, subnormal temperature, and general abdominal distension. Operation, which was carried out forty-nine hours after perforation, revealed a perforating ulcer on the anterior aspect of the duodenum about half an inch beyond the pylorus. The edges of the ulcer were, as usual, thickened and oedematous. The opening was closed by purse-string suture; the abdomen mopped out very lightly and rapidly; suprapubic drainage employed. He was kept in sitting position with continuous rectal irrigation. He made a good recovery, but is now again complaining of indigestion, and will probably require gastro-jejunostomy.

A very interesting feature in this case was the following: For the past three years, as a result of a severe attack of influenza, he had suffered from complete loss of smell. The day after operation he noticed that his power of smell had returned, and it soon became unusually keen.

CASE IX (*January 25th, 1908*).—Archie M'C., aged 22. Ailing with intermittent attacks of epigastric pain since 19 years of age. Pain always came on about three hours after food, and was always relieved by food. The pain was confined to the epigastrium, never radiated into the back. He never vomited, and had no eructations of gas or pyrosis.

Perforation.—On January 25th, 1908, at 7.30, whilst out walking, he took sudden abdominal pain. He managed to walk home. He was sent into hospital the following night. Operation was undertaken seventeen and a half hours after perforation. A perforation the size of a threepenny-piece was found on anterior surface of duodenum, three-quarters of an inch from the pylorus, surrounded by a zone of inflammatory induration about the size of a shilling. The perforation was closed by catgut suture, abdomen flushed out and drained suprapubically. He was kept in the sitting position, and continuous rectal irrigation with saline solution maintained. At the time of operation he was profoundly collapsed; pulse 140, and very feeble. He made a good recovery, which I attribute to the posture and rectal irrigation.

CASE X.—John M'C., aged 44. Operated on for perforation on July 21st, 1907 (see Case V). Shown at a meeting of the Ulster Medical Society on March 5th, 1908, when he declared he had been in perfect health since the operation. On March 9th, 1908, he again perforated without any premonitory symptom. Operation four hours after perforation. An opening the size of a threepenny-piece was found at the site of the old ulcer. This was closed by a purse-string suture. It was clearly inadvisable to run the risk of a third perforation, so we decided to perform gastro-jejunostomy. (1) As the jejunostomy commenced at the

right side of the vertebral column, and (2) there was a very thick deposit of fat between the layers of the transverse meso-colon (which I regard as a contraindication to the posterior operation), an anterior gastro-jejunostomy according to Roux's Y method was carried out. He made a rapid and complete recovery, and remains in perfect health.

CASE XI.—Mrs. O., aged 56, suffered from typical hunger pain for six years. On May 7th, 1908, perforated whilst on her way to see Dr. Jameson. He promptly sent her into a nursing home. Operation within five hours. On opening the abdomen we found the stomach enormously distended. I at first thought we had made a mistake in diagnosis, and that our case was really one of acute dilatation of the stomach. I incised the organ, and removed about three pints of fluid contents. When the stomach had collapsed we at once found a perforation on the anterior surface of the duodenum ¾ in. from the pylorus. This was closed and poster o: gastro-jejunostomy was performed. A glass drain was inserted into the pelvis, the peritoneum gently mopped out, and the abdominal wound closed without drainage. The operation occupied forty-five minutes. She was nursed in the sitting position, with continuous rectal saline. Recovery was rapid and complete.

CASE XII.—Mr. H., aged 36, seen with Dr. R. M'Dowell. History of hunger pain at intervals for several years. Perforated on May 25th, 1908. Operation in a nursing home nine hours later. Perforation in centre of a cicatricial mass on anterior duodenal wall, about ½ in. from pylorus; this was rapidly closed, as collapse was profound; local and pelvic drainage employed. He was nursed in sitting position, with continuous rectal saline. He did well till fourth day, when he began to complain of abdominal discomfort. Next day he vomited. Examination showed that the stomach was becoming dilated. He was accordingly washed out, and this gave great relief. Lavage was repeated several times, but as he was evidently sinking, we decided to perform gastro-jejunostomy. This was done on the eighth day after perforation; the original wound being separated by blunt dissector. Convalescence was delayed by a severe attack of septic broncho-pneumonia, but recovery was ultimately complete, and he is now, one year after operation, in excellent health.

CASE XIII.—Wm. C., aged 28, a painter. Had occasionally passed blood per rectum, and for two weeks before perforation had complained of epigastric pain. On evening of June 11th, 1908, whilst in the street, he was suddenly seized with intense abdominal pain, and brought to the Royal Victoria Hospital in a collapsed condition. Diagnosis of perforative duodenal ulcer was made, and operation undertaken about three hours after perforation. An opening the size of a pea was found on the anterior surface of the duodenum, immediately outside the pylorus. This was closed. As the pelvis contained a large quantity of fluid a glass drain was inserted. The peritoneal cavity was not "cleansed." He was nursed in the sitting posture, with continuous rectal saline. Recovery was uninterrupted. He left hospital three weeks after operation.

CASE XIV.—Saml. K., aged 30, a bread server. Had suffered for years from typical "hunger pain." On October 30th, 1908, whilst at work, he was seized with intense abdominal pain. Dr. Blakely saw him shortly after; diagnosed perforation, and had him removed to hospital. Operation about five hours after perforation. We found an opening the size of a small pea on the anterior surface of the duodenum, about ¾ in. from the pylorus. This was surrounded by a zone of dense indurated tissue. The opening was closed. Posterior gastro-jejunostomy was performed, pelvic drainage provided, and the usual arrangements made for continuous rectal saline. He made a rapid recovery, and was discharged seventeen days after operation, feeling in excellent health, and remains well.

CASE XV.—Branton M'N., aged 19. History of indigestion with melaena. On December 24th, 1908, was seized with abdominal pain after supper. Sent for Dr. Blakely on 25th, who diagnosed perforation, and sent him into hospital. At the operation, eighteen hours after perforation, we found a small opening on anterior surface of duodenum at junction of first and second portions. The opening was closed, and pelvic drainage provided. He was as usual nursed in the sitting posture, with continuous rectal saline. He made a good recovery, and left hospital three weeks after operation feeling quite well. About a fortnight ago his brother came to inform me that he was again suffering from indigestion. I advised gastro-jejunostomy.

CASE XVI.—Ed. M., aged 50, gravedigger. Typical history of duodenum ulcer for years. Perforation while at work on July 6th, 1909, at 5.30 p.m. Seen by Dr. John Jameson about 9 o'clock; promptly sent into hospital, where operation was undertaken at 10.30—that is, five hours after perforation. We found very extensive induration, involving pyloric end of stomach and first portion of duodenum. A perforation large enough to admit the tip of little finger on anterior surface of duodenum just beyond pylorus. This was closed, and as pyloric obstruction was sure to follow, posterior gastro-jejunostomy was performed. Local and pelvic drainage provided. Usual continuous saline. Satisfactory recovery.

In addition to the above, the following cases have been operated on in the Royal Victoria Hospital during the past five years:

Twelve Cases—Nine Recoveries.

*1. William P. Time after perforation not stated. Operation July 7th, 1905. Died.

*2. Samuel H. Operation January 7th, 1906. Died.

3. Agnes C., aged 40. Operation April 26th, 1907, four hours after perforation. Posterior gastro-jejunostomy at same time. Ulcer on anterior surface, just beyond pylorus. Recovery.

4. Samuel G., aged 45. February 11th, 1907. Time after perforation not stated. Ulcer on anterior surface, just beyond pylorus. Recovery.

5. Lizzie M'K., aged 50. September 1st, 1907. Time not stated. Suture and gastro-jejunostomy. Recovery.

6. Bernard B., aged 30. March 29th, 1907. Time not stated. Ulcer just beyond pylorus. Recovery.

7. Thomas M. September 25th, 1908. Recovery.

8. William N. January 9th, 1908. Recovery.

9. John M'G., aged 54. August 1st, 1908, thirty-six hours after perforation. Ulcer at junction of first and second portions. Died.

10. John L. December 11th, 1908, twenty hours after perforation. Recovery.

11. John M'B., aged 40. April 8th, 1908. Repair and anterior gastro-jejunostomy. Ulcer on first part of duodenum. Recovery.

12. Robert H., aged 30. June 13th, 1909. Operation three hours after perforation on first part of duodenum. Recovery.

Four cases were admitted on which no operation was performed, as they were obviously moribund.

The complete lists give 28 operations with only 3 deaths.

In 7 cases gastro-jejunostomy was performed immediately after closure of the perforation, and all of these recovered. One of my patients (Case 12) required gastro-jejunostomy on the eighth day. He also recovered. Another case had gastro-jejunostomy sixteen months later, and is now in excellent health. Two others have again complained of "indigestion," and I have recommended gastro-jejunostomy. One patient perforated twice within nine months.

* Operated on before the use of continuous rectal saline had become routine.

REFERENCES.

1 *Diseases of Intestines*, p. 294. 2 Ibid., p. 291. 3 Corner, BRITISH MEDICAL JOURNAL, May 29th, 1909. 4 *Lancet*, March 31st, 1906.

DISCUSSION.

Mr. WARD COUSINS (Portsmouth) said the amount of shock which occurred in some of Mr. Mitchell's cases could be easily explained by the escape of only a small amount of fluid at the time of the perforation into the peritoneal cavity. He had in several of his own cases found this to be the probable cause. He thought that the delay in performing the second jejuno-gastrostomy was a very wise proceeding. Sometimes the cure was perfect without it, and when urgent gastric trouble continued it could be done afterwards under more satisfactory conditions.

Mr. W. THELWALL THOMAS (Liverpool) agreed with Mr. Mitchell on the need for the abstinence from morphine, and the importance of the Fowler position and the Murphy rectal perfusion of saline. He thought they also owed much to the use of ether by the open method. These modern methods were unfortunately often imperfectly applied, and much depended on the careful attention to the detail insisted upon by the originators.

Mr. MITCHELL, in reply, desired to emphasize the harm done by opium: (1) Even if diagnosis has been made and operation decided upon, opium should still be withheld, because its use is liable to be followed by relaxation of the pyloric sphincter and further escape of stomach contents. (2) The effect is to make the patient feel so much better, and the friends think him so much better, that he and they are very apt to plead for delay, in the hope that operation may be avoided, whereas, while the pain is severe, they are quite willing to permit anything to be done.

DISCUSSION ON MODERN METHODS IN THE TREATMENT OF TUBERCULOUS DISEASE OF JOINTS.

OPENING PAPERS.

I.—Sir WILLIAM MACEWEN, LL.D., M.D., D.Sc., F.R.C.S., F.R.S.,
Regius Professor of Surgery, University of Glasgow, etc.

[ABSTRACT.]

THE pathological phenomena associated with tuberculosis of bones and joints must be clearly determined before a rational basis of treatment can be formulated.

The importance of gaining a conception of the exact pathological conditions present in each individual joint cannot be over-estimated, as it is only in this way that an intelligent discrimination may be made of the special

variety of treatment required and the best mode of applying it. Treatment that is applicable to tubercle in one stage of its development may not be equally applicable in other stages. In the grey stage of tuberculosis, while the tubercles are small and discrete, and there are still dilated blood vessels in their immediate vicinity, it may be treated with success, and its further progress may be arrested both by acting through the blood stream and by the topical application of chemical substances. When once the tuberculous foci have become confluent and caseation has ensued, such dead tissue cannot be so easily acted on. The blood stream does not reach it, and action on this inert mass must be through the medium of the surrounding living tissues, which, while maintaining their own vitality at such a level as to resist further microbic invasion, will at the same time afford means for the production of either of two conditions.

First, the throwing out of a barrier which will wall off the tuberculous focus from the surrounding living tissue and stop its further progress; and secondly, which will produce absorption of the dead material and destruction of the tubercle bacilli. In this case the surrounding tissues must be aided in doing this work. Where the dead focus is too large for ready absorption, it may be directly acted on by chemical agents, and, in some instances, by operative removal.

When the tuberculous process has spread between the bone and the cartilage to such an extent as to produce shedding of the latter, the so-called ulceration of cartilage becomes manifest. If left alone, such a joint would at best, under favourable circumstances, become ankylosed, so that a stiff joint would ultimately result. Here a definite issue is raised as to the course of treatment required. Should it be palliative, or should opening of the joint and removing therefrom all the tuberculous matter be resorted to?

Is it advisable to leave all such joints to become stiff and meanwhile to run the risk of liquefaction of caseated material, and have the joint capsule destroyed and tuberculous sinuses form for the evacuation of the liquefied caseated matter, with the possibility of secondary infection and of auto-tuberculous infection, followed it may be by disseminated miliary tuberculosis? Or is it better to remove the whole of the diseased tissue of the joint and neighbouring bones, so as to enable the patient to make a speedy recovery and to have his general health restored?

In determining this question, one requires to bear in mind that in tuberculosis of a joint it is not the joint structures alone which suffer by the persistence of this disease, but the muscles, nerves, bones of the limb, and also the body as a whole. The atrophy of the muscles of the limb, due partly to disuse, but more often to ascending trophic neurosis, when allowed to proceed for a prolonged period is not easily recovered from. Therefore, the condition of the muscles, nerves, and bones, as well as the articulation immediately concerned, requires careful consideration, and causes us not to defer unduly or to delay operative procedure meant to hasten the cure. It must be apparent that the individual joints require to be considered separately when advanced treatment is concerned. In those joints in which excision can only result in ankylosis, the possibility of attaining this end by other means, such as rest and extension, may be advisable according to the degree of destruction which has ensued, provided the muscles do not atrophy meanwhile; whereas in those joints where, after excision, free movement is attained, such operations may be advised at a much earlier period, when the muscles and other soft structures are still in a good condition and long before atrophy ensues.

If it be possible to operate before the capsule of the joint be destroyed and the epiphyses are disintegrated, the operation will be less extensive and the results much better. Where movement is required after such an operation, it is of great moment to preserve all the attachments and relations of the tendons intact. This can hardly be done in such a case as the shoulder-joint, if the destruction of the articulating bones be great; but at an earlier period operation may arrest the disease, and a very much better result from excision may be obtained.

It ought to be remembered that the extension of the tuberculous process into the synovial sheaths of the tendons often produces adhesions which, if fully formed, may limit or prevent the ultimate movement of the limb. Excisions ought to be performed before such an extension into the synovial sheath ensues.

It must be further determined whether the tuberculous process has attacked the bone, the synovial membrane, or both. In children the epiphyses are usually attacked first, and in the long bones the rarefying epiphysial osteitis which ensues prevents enlargement, and thus a sign which indicates tuberculosis in the long bones of the hand and foot, that of swelling, is here usually wanting *as long as the disease is confined to the bone.*

The patient is often not brought to the surgeon at this period, but in the later stage, when the synovial membrane begins to be enlarged. This swelling of the synovial membrane appeals to the parents, whereas the original deposition in the bone is hidden and often develops to a marked extent before its presence is discerned. Yet it is just at this period, while the tubercle is confined to the bone, that treatment can effect so much, and in such cases treatment directed to the synovial membrane alone will not cure the disease.

Every endeavour ought to be made to check the advance of the disease from the epiphyses to the potential space between the cartilage and the bone, in which once it has started it spreads with such rapidity, and to the synovial membrane which is attacked usually from the margins.

The anatomical arrangement of the joints relatively to their capsule is such that it is difficult for the surgeon to have access to the epiphysis without penetrating the synovial membrane or the epiphysial cartilage; and if this membrane be still free from disease, auto-infection would be apt to follow any extensive removal of tubercle from the epiphyses. In the early period of epiphysial bone invasion it is of importance that access to the bone be freely secured. In order to obviate any such mishap as tuberculous infection of the synovial membrane during such procedures, the operation is divided into two stages. The first stage is the opening of the synovial membrane at a part which would give access to the epiphysis, and which would at the same time not interfere with the movements of the joint. Adhesions are thus secured between the two layers of the synovial membrane, so that the part selected for the operation on the epiphysis will be freely exposed, while the infection of the synovial membrane is thus prevented. In this way also the epiphysis may be tunnelled without interfering with the articulating cartilage. It is needless to say that such an operation must be conducted with strict asepticity.

Treatment (in abstract).

In the early stage, where grey tubercle is still discrete in the epiphyses, one may act through the blood stream by inducing active phagocytosis and increased leucocytic vigour, and locally, by the application of chemical substances introduced into the centre and immediate vicinity of the tuberculous part. One of the best of these is sterilized iodoform emulsion, introduced through sterilized tissue, the injection to be maintained until the needle is withdrawn from the skin. This ought to be carried out before the synovial membrane becomes involved, and while the disease is confined to the epiphyses, as the treatment is then most efficient. When the synovial membrane is affected at the early stage the parenchymatous tissue ought to be injected with the same emulsion.

Massage of the muscles of the limb ought to be resorted to from the outset to prevent atrophy. Rest, fixation of the joint, and relief of pressure, combined with exercise in the fresh air, and living out of doors, generous diet and warm clothing, are necessary adjuncts.

In the second stage, when the tubercles have become confluent, and caseation and liquefaction ensues, the treatment is directed to stimulating the action of the surrounding tissues and the inhibition of the activity of the tuberculous organisms. Iodoform emulsion is still of service, though at this stage it takes longer to produce its effect, and requires to be given frequently and in gradually increasing doses. If this advanced lesion is still confined to the epiphyses, its rapid eradication may become advisable, access being gained through a space walled off from the joint by synovial adhesions. This procedure should be carried out radically, so as to prevent the joint

from becoming involved. When a cavity is left in the bone by the removal of the caseating and necrotic tissue, it is filled with a mixture of iodoform and boracic acid, 1 to 4. The iodoform used in this mixture is in the form of large scales, which are not readily absorbed, but which remain in the tissues, producing their effect locally over a long period. By using these large scales the poisonous effect produced by the fine powdered iodoform is prevented, though the systemic effect of the drug is then very slight. The *x* rays will show the presence of these large scales of iodoform. The finely powdered iodoform generally in use is never employed for such purposes, as serious symptoms may ensue from rapid absorption, and because its local effects pass off too quickly.

All pressure on the articulating surfaces must be studiously prevented, the limb being fixed in a splint which will enable the patient to take exercise in the fresh air and to remain out of doors. Massage of the muscles of the whole limb above and below the joint must be looked to to prevent trophic changes and to increase the flow of blood not only into the muscles themselves, but into the periarticular structures.

When the synovial membrane is involved at this stage of the disease the potential interspace between the articulating cartilage and the bone is usually already implicated.

Collections of liquefied tubercle ought to be carefully injected with sterilized emulsion, the limb being placed in different positions in order to allow the action of gravity to aid in the deposition of the iodoform on all surfaces of the false membrane forming the wall between the liquefied tuberculous product and the normal tissues. The liquefied product ought to be subsequently evacuated through the hollow needle, and every endeavour ought to be made to prevent the formation of sinuses, which exposes the patient to secondary infection. If sinuses have already formed, the injection of the subnitrate of bismuth is of service in showing their tortuous course by the *x* rays, and the subnitrate of bismuth seems also to have a curative effect.

The treatment of the joint by Bier's method when unaided does not seem to be efficient, but as an adjunct it is of service when judiciously applied and in the earlier stages of the disease.

In the third stage of the disease, when articulating cartilage is shed and when one is confronted with ankylosis as the best result of palliative treatment, the question of removal of the disease by exposure of the articulating extremities of the joint requires to be decided. As soon as the articulating bones and the joint structures are the seat of liquefied tuberculous products general dissemination is apt to occur, and tuberculous meningitis frequently follows, especially in children. In many such cases the disease has been primarily located in the epiphyses or in the joint and confined to that focus for a considerable period, and the general invasion of the system has come from that source after caseation and liquefaction of the tuberculous product has ensued.

In considering the question of excision one has to bear in mind that the remarks here made do not apply to the classical excisions of joints given in most textbooks, but to specially modified excisions, aiming first at the thorough removal of the disease; secondly, at the preservation of the length of the limb and especially the restoration of its function. Where possible these are best attained by intracapsular excisions of the articulating extremities, without disturbance of the insertion of the tendons. Such operations can best be carried out before the capsule of the joint has become destroyed and the synovial sheaths of the tendons and the peri-articular tissues have disintegrated. In performing these operations the inter-articular structures and the whole of the cut surfaces must be protected from auto-infection.

(Details of the special excisions of joints and the excellent results ensuing were afterwards referred to.)

Such excisions give excellent results and have the following advantages: First they remove the disease—radically—prevent thereby dissemination, shorten the treatment and enable the patient rapidly to regain his general health. They also preserve in great measure the length of the limb, and its function is quickly restored.

II.—Robert Jones, F.R.C.S.Edin.,

Honorary Surgeon, Royal Southern Hospital, Liverpool, etc.

Surgeons of large experience in the treatment of joints must needs be struck by the differences which tubercle exhibits when it affects the adult as compared with its behaviour in the young. In the child, under suitable control, its progress is benign; in the adult, it is intractable and infinitely more grave. It is very many years since I have had occasion to excise a joint in a child, while I constantly, at a comparatively early stage, operate on the adult. In a child an early excision is not justified by our experience of the clinical history of the disease, while a late excision is useless, an amputation being usually needed. Either an early or a late excision in childhood, to be mechanically effective, will involve serious interference with subsequent growth. We occasionally see even yet the shortened and frequently flail limbs which resulted from the operative surgery of over twenty years ago, before the teachings of the late H. O. Thomas, of Liverpool, had brought about a change in practice. In the adult, general dissemination is more apt to occur, time is of more importance, and operative result is mechanically more effective. It means an earlier and more complete fixation of joint than Nature laboriously and often unsuccessfully strives for. Operations with the object of preserving function are rarely possible. Without laying further stress on this point I will chiefly direct your attention to tuberculosis in the child.

Certain chronic infective articular affections simulate tubercle, but this is the case much more often in the adult than in the young. In such cases, for the purposes of diagnosis, reaction to the new tuberculin is fairly reliable, while radiography is of little use; indeed in many instances the discovery by exploration of the staphylococcus, streptococcus, or pneumococcus is essential to diagnosis.

To begin with, I would draw attention to the interpretation of the important sign we all call rigidity, and the comparatively unimportant symptom, pain. Rigidity is the very early sign, and is ascertained before there is any evidence of muscular shrinkage. In arthritis, no matter what the joint, the rigidity affects it in all directions—flexion, extension, abduction, adduction, and rotation. In a suspected joint, if there be no limitation of movement, there is no arthritis. I have come to look upon this as an axiom, for the exceptions to the rule are so extremely rare. In early cases the rigidity must be examined for without an anaesthetic, as it is primarily due to muscular action; later, contractures or muscular shortening will follow as secondary effects, but by this time a diagnosis will be obvious.

As an illustration we will take the case of the spinal column. A boy complains of pain in the centre of the spine. The surgeon asks him to flex, extend, and laterally bend it, which he is able to do. We can therefore exclude a spondylitis. Another boy may be tender over the spine, have great difficulty in flexing his column, but he can hyperextend it with ease, and here again we can place to one side our suspicion of tubercle. In a third case the spine is rigid in all directions, and this symptom is quite in accord with a tuberculous lesion. This general rigidity is more reliable than any single symptom, or any single group of symptoms. Pain, as evidenced by pressure on the vertebral spines, is hopelessly unreliable, and, if present, is an argument against rather than in favour of a Pott's lesion. The same is true of all other joints. A youth complains of swelling and stiffness of a joint which he cannot fully flex, but he is able to fully extend; we may be sure he has no tuberculous trouble. I would desire to press the point, therefore, that in arthritis the movements of a joint are limited, not in one, or some, but in all directions.

Pain, so often referred to, is neither a constant nor a valuable symptom, and in a tuberculous joint is often practically absent from first to last.

Our textbooks are very silent as to any tests whereby we may judge of the recovery of joints, and yet it is very important, if our treatment is to be effective, that we should possess some reliable data as to when treatment should be discarded. This lack of definite instruction is the source of many so-called relapses. We may consider that a joint has recovered from its disease when its range of movement is not diminished by use, or, if the joint be ankylosed, where its position does not alter by use. For

instance, an elbow joint has been slung up at an acute angle until the surgeon thinks it may be well. He then lengthens the sling two or three inches and notes the result. If the patient's arm has shortly dropped these inches, and he can voluntarily raise it back again, recovery with movement may be predicted. If the arm stiffens in its new position disease is still active. If it does not fall from its acutely flexed position to the lowered sling, then a recovery by ankylosis has been attained. Similarly in other joints. A knee which has been kept fully extended and at rest is released. Should it begin to flex and stiffen, it is still unsound. Should it remain fixed and extended, it is a sound ankylosis; if it should both flex and straighten ever so little, it is a sure sign of recovery with movement. In the hip the most convenient diagnostic test is that of flexion. If the patient leaves with a flexion of 20 degrees and returns with one of 40 degrees, then recovery has not taken place. The test of recovery is, therefore, based upon a careful experiment, and the cautious surgeon will so conduct that experiment that all unnecessary risk may be avoided.

I have always advocated that tuberculous joints in the young should be treated by complete rest, open air, and good food. The more I see of the disease in my own clinic, and in those of others, the more assured I am of the paramount value of rest. The more complete the rest, other things considered, the more benign is the course of the affection. The joint should be rigidly fixed in an appliance, and weight-bearing denied. Traction or extension should be looked upon as an inferior method of procuring rest. Efficient fixation without traction will very soon govern muscular spasm. Traction may, of course, be used to correct deformity, but there are more effective ways of doing even this than by weight and pulley.

I place great importance upon keeping tuberculous children in the open air, and have for many years refused to admit them into a town hospital excepting for the short time necessary to rectify deformity. They do infinitely better lying out of doors in a slum than indoors in a mixed ward in even the most sanitary of town hospitals. I happen to work at institutions where (*a*) tuberculous children are indoors all day, (*b*) where they are out several hours a day, (*c*) where they are out all through the day, and, lastly, (*d*) where they are out by day and by night. My experience is entirely favourable to the maximum of open air. This fact is happily being generally recognized abroad, and doubtless in time all tuberculous and most other children will be treated outside. The days of children's hospitals in town are numbered. The children of the poor can be kept lying in the open on an improvised couch chained to the railings if there be no one to act as nurse. The windows of their sleeping apartments should be open all night. An immediate result of sleeping in the open is an increase of appetite, and specially generous diets should be given. At Baschurch, one of the institutions above referred to, excellently cooked food of unusual variety is given without limitation. The children are encouraged to eat, and it is inspiring to note their rapid physical development.

The splints used should be of the simplest kind, and should be so devised as to minimize or prevent deformity. In the hip the limb should be secured in the extended and abducted position. This will mechanically remedy any shortening due to arrest of growth or displacement upwards of the head, and prevent the rolling gait inseparable from adduction. The spinal column should rest on a convex surface to prevent angular flexion. When we recollect the site of disease in front of the vertebral bodies and the subsequent telescoping that occurs, the value of this hyperextended position will be apparent. The ideal position for the shoulder is a lateral one at an angle of 45 degrees from the body, in order to secure better abduction. The knee should be kept extended and the elbow flexed, according to the ultimate needs of the patient, while every wrist should be kept hyperextended. The hyperextended position is of great importance in the treatment of the wrist, and yet it is invariably treated on a straight splint, which results in ankylosis in a somewhat flexed position. If one wishes to grip powerfully, the wrist is first instinctively hyperextended. One *cannot* grip effectively with the wrist flexed or straight. If disease at the wrist be directed to ankylosis in the hyperextended position, every advantage will accrue to the patient's power of grip. So true is this that, when a patient comes with flexed and stiffened wrist and faulty fingers, I attack the ankylosis with a wrench and place the wrist in full extension. In ankle-joint trouble, especially where the mid-tarsal joint has been involved, the ankle should be fixed in such a position that the heel should first impinge upon the ground. We nearly always find it stiffened in a position which prevents the heel from touching the ground. This is wrong, for at every step the patient takes a cross-breaking strain is cast upon the joint. Ankylosis is so commonly the result of treatment that we must always study the most useful position for a stiff limb.

Should abscesses present, what are we to do? In days gone by I used to open up and drain nearly every abscess cavity I could find—this irrespectively of any symptoms that were present. Since then I have employed incision and immediate suture, aspirations, and the injection of a variety of emulsions, including the creosote and camphor naphthol of Calot. The experience of such cases with those treated expectantly has convinced me of the value of leaving certain types of tuberculous collections alone as long as possible. I disregard them if they give rise to no symptoms. They are only serious or urgent if they are infected from within or without. It is a mistake to attach the clinical importance to a tuberculous abscess that we do to a collection of pus. The tubercle bacillus we know is not pyogenic. Where true suppuration occurs, it is due to a secondary infection. Efficient fixation undoubtedly lessens the liability to abscess formation, and also facilitates their disappearance. In a well immobolized spine quite a large proportion of these abscesses disappear. Writers who do not observe this obviously never give time for it to occur. In the hip-joint they are especially apt to become nomadic, changing their residence from within the joint to residence without. They become extra-articular in the sense of having no connexion with the joint. Often I have noticed collections having appeared from the joint travel down the thigh, become isolated, and then gradually dwindle away. The process of absorption is not characterized by any clinical manifestation. I refuse to open tuberculous abscesses early, not because I dislike a radical operation, but because an operation is necessarily incomplete and ineffective if it cannot remove the disease of which the abscess is but a symptom. If opening the abscess meant the eradication of disease, clearly the problem would be solved.

In many cases, however, the abscess is not absorbed, but travels towards the skin. An abscess which forms early in tuberculous disease and is evacuated is, in my opinion, a more serious affair than the abscess treated in this later stage. Simple aspiration of a distended sac will prove of value, and this may have to be frequently repeated. Usually, however, I prefer allowing the abscess to invade the surface, when I make a small puncture ½ in. in length (or less), using the strictest aseptic precautions, scrupulously avoiding the Volkmann's spoon or irrigator, for I do nothing to interfere with the thick sac wall, which provides so admirable a barrier against infection. If these abscesses be attacked in this way the terrors of infection are assuredly much diminished, for the delay of many months in opening the abscess has given the joint time to make progress, the supply of débris is shut off, and the long, exhaustive discharge which follows early incision is curtailed. I have no conviction more settled in my mind than that of the value of a conservative attitude towards tuberculous abscesses. When we remember that hospital surgeons, with all the facilities for the practice of a rigid asepsis, see only an infinitesimal proportion of these cases, and that the overwhelming number are in the hands of practitioners in slums and country places, handicapped by their environment, totally unable to insist on surgical cleanliness, the policy I advocate seems to me of great importance. My experience warrants me in saying that numbers of children die in all parts of England and Wales because we do not realize the many responsibilities involved in the routine opening of tuberculous abscesses.

If, however, with the presence of fluid, discomfort, pain, and temperature are present, or if the patient rapidly or steadily declines in condition, then the abscess may be suspected and attacked by good incision, bone searched

for, and antiseptic irrigations adopted. Here there will be found a mixed infection, and surgical interference is urgent and most effective where most radical. Again, for geographical reasons a retropharyngeal abscess demands immediate incision, preferably behind the sterno-mastoid, and in those rare instances of collections in the posterior mediastinum where one finds spasmodic attacks of dyspnoea, evacuation should be immediate by costotransversectomy over the affected articulation.

I do not operate for pressure paraplegia, because 97 per cent. recover without. Such cases should be well hyperextended, and recovery may take place after so long as four years of paralysis. The treatment of deformity in the presence of disease cannot be stated authoritatively. One can only tell one's belief and practice, however heretical it may appear. Excepting in the spine, I invariably reduce deformities in whatever stage of the disease they may be presented to me. In the so-called acute stage this is easily accomplished; in the more chronic case with pronounced flexion it is less easy; in firmly ankylosed cases still unsound, osteotomies may be needed. However the reduction be effected, complete rest for a considerable period should follow in order to control reaction. We must remember that sinuses will continue to discharge after Nature has quite immobilized the joint, and such prolonged discharges are invariably of mixed infection. The recent introduction of bismuth in such cases is valuable both as a means of diagnosis and treatment. For diagnostic purposes, a sterile mixture of bismuth subnitrate 1 part, and vaseline 2 parts, mixed while boiling, is injected into each sinus and the track radiographed, preferably by the stereoscopic method. By this means the disease can often be focussed in old cases which are recovered of all but their sinuses.

Careful observers have reported exceedingly well of the treatment of such sinuses by the injection of bismuth paste. It is composed of bismuth 6 parts, white wax 1 part, vaseline 12 parts. This treatment is more favourable in ramifying intricate sinuses not complicated by active bone disease—a class of sinus much more common than supposed. This type of sinus is more frequent in the adult than in the child, and is often the only argument upon which the diagnosis of active disease is founded. In such cases in the adult, accompanied by marked flexion and adduction at the hip, with a thick mass of bone in place of the femoral head and neck, I have often to correct deformity. The patient may have 5 in. or more of shortening with sinuses which have lasted years. In such a case an osteotomy is not adequate, and a wedge must be removed by open incision. Traction applied to the hip, with the necessary forcible manipulation in the presence of a large open wound, is a severe procedure, and to minimize risk it is well to divide the operation into two stages with an interval of a fortnight. The first stage should consist in removing a wedge from the femur, leaving about a fourth or fifth of the diameter intact. The wound is then allowed to heal, when the second operation is performed. This consists of simply fracturing the limb. A somewhat severe operation is thus reduced to quite a simple one, and traction with abduction can forthwith be harmlessly applied. Subcutaneous division of the adductors is generally demanded where we need abduction of the limb.

Although we are not called upon to discuss the treatment of cured but deformed tuberculous joints, I would offer a suggestion in reference to a problem often put to me. An ankylosed adult knee is presented, supposed to have recovered from tubercle, but more often of septic origin. A skiagram shows a barely appreciable damage to the bony contour. Is it safe to endeavour to bring about movement? If the case is otherwise suitable, a careful experiment may be made. Should the knee present, say, an angular deformity of 15 degrees, a splint should be affixed presenting an angle of 20 degrees. The limb should be gently forced and bandaged to it for about ten or fourteen days. The splint can then be removed, and the limb left loose in bed for a week or so. If any additional movement exists, a good prognosis may be given, and the treatment can be safely and more actively proceeded with. If it remain stiff, to persevere may end in disaster. To break down such cases, as a bonesetter would, or to endeavour to enforce "passive movements," would be a highly hazardous adventure.

Sir William Macewen has referred to tuberculin, which I often find most helpful, and to passive hyperaemia, and on these subjects I should like to add a word of warning. The disciples of Bier, Wright, Marmorek and others, if they are to do good service, should exercise moderation in the carrying out of their views. It is a mistake to imagine that any single one of them possesses the whole truth. I have already seen many tuberculous children deprived of their splints for many weeks while undergoing one or other course. The results have often been disastrous and sometimes even tragic. This will surely often recur until all who adopt and practise these methods make a closer clinical study of the natural course of disease. Tuberculin can be given, or hyperaemia applied, without discarding the positive advantages derived from the prevention of deformity and the breathing of country air.

DISCUSSION.

Professor SONNENBURG (Berlin) said: In the last few years I have tried every method of treating tuberculosis of joints. I now operate much more seldom than formerly, as the results were not satisfactory. Later on I have also tried the serum of Marmorek, and had good results in some cases, especially those with sinuses. With regard to the question of excisions and resections, I adhere to the principles enunciated by Sir William Macewen. For several months past, in association with Robert Koch, I have been using injections of the new tuberculin, and have treated in all about 20 cases by this means.

Dosage.—A preparation from cultures is employed, as thereby better immunization is obtained. Before commencing treatment some blood is drawn, which is tested for antibodies. The Pirquet reaction is also made. On each arm in two places a drop of 55 per cent. old tuberculin is placed, and where these drops are a scratch is made on the epidermis with a suitable instrument, or even with a knife. There should be no bleeding, or the smallest amount possible. Also a control inoculation with physiological salt solution. In positive cases red bumps are caused which, if there is strong reaction, may develop into pustules. After this the treatment begins, premising that at first only a very weak solution, 0.001 mg., is given. This is gradually increased, and, indeed, if no reaction occurs, on the next day but one the next higher dose can be injected, namely, 0.002, then 0.003, 0.004, 0.005 mg.; and after that the dose may be increased more rapidly to 0.007, 0.008, 0.01, 0.015, 0.02 mg., and so on.

Reaction.—It is best and most to be desired that the rise of temperature should be between 37° C. and 38° C. But very often there is a much higher reaction, rising above 40° C. The reaction usually appears some hours after the injection. The higher reactions are accompanied by the usual symptoms of fever (headache, pains in the limbs, etc.), but these soon disappear and seldom last more than one day; but sometimes a fever may be observed where the reaction continues for three days. Generally and as a rule there is a quicker return to normal. If there is reaction, some days should elapse before repetition of the injection, until all is quiet again, and then it is to be recommended that the last dose should be repeated, or even a smaller one used, until no reaction follows, after which the increase of dose can be proceeded with. Every four weeks the Pirquet experiment is to be tried afresh. If this is negative, a new examination of the blood is made to see whether antibodies have formed. This blood is only to be drawn some days after the last injection, so as not to come in the "negative phase."

Site of Injection.—The injections are best made on the chest or on the back between the shoulder blades. It is not advisable to use the arms, or, in the case of patients who are up, the legs for this purpose. The injections are usually somewhat painful and cause infiltrations (glycerine) which sometimes require treatment with compresses (liq. alum acet.). It is advisable to use a cupping glass for twenty minutes immediately after the injection. Local reactions are sometimes observed. Sometimes a shivering fit occurs after the injection, probably resulting from injection into a vein. We first see the formation of antibodies after larger doses have been attained (1 mg.). So long as the antibodies are still

present in the tissues and they do not enter the blood, so long the body will continue to react to tuberculin. (The opsonic index sinks after each injection for two to three days.)

The treatment must be pursued for many months or years. The effect begins when the antibodies are in the blood. In contrast to the first tuberculin of Koch, the new remedy does not cause any reaction.

The antibodies, which are formed by injection of dead material, seem to be the same as those which are formed and found in animals affected with tuberculosis. The time is too short to give positive results of the new treatment. I hope to have aroused your interest for the new treatment by this short communication.

Mr. A. H. TUBBY (London), speaking of *para-articular tuberculosis*, said: In some joints, especially where the epiphysial line is entirely without the limits of the capsule or partially so, a deposit of tubercle occurs in the juxta-epiphysial region, either on the shaft or epiphysial side of the lesion, and for a time the focus of disease is entirely extra-articular. But unless the case is recognized early and adequately treated, experience shows that the morbid process extends through the bony substance of the epiphysis, and eventually invades the joint. It is therefore necessary to recognize the existence of this type of the affection. Sometimes, however, pus forms externally to the joint, and then bursts its way through the capsule into the joint. In joints where the epiphysial line is entirely included within the limits of the synovial membrane, involvement of bone generally results in tuberculous arthritis, but in certain instances to be noted the joint escapes for a time, and for a time only. At the lower end of the radius, the lower end of the fibula and the epiphysis of the great trochanter a para-articular tuberculous abscess may be present for a time without involvement of the joint. The epiphysial lines of the lower end of the radius and the lower end of the fibula are markedly within the articular limits, while the epiphysis of the great trochanter is, especially at its posterior part, outside the limits of the hip joint. As to the olecranon, involvement of it usually means disease of the elbow joint, but Ménard has reported a striking example to the contrary, and according to C. G. Cumston[1] if the lesion is localized either laterally or on the posterior aspect of the olecranon the articulation may escape for a time. Epiphysial or juxta-epiphysial tubercle at the lower end of the femur and upper end of the tibia, at the lower epiphysis of the humerus, and the head of the radius, are associated very early with invasion of the joint, although Bonnet described a case of typical tuberculosis limited to the epicondyle. It therefore follows that some joints are more quickly invaded than others, but there is no doubt that all will become involved in time if the extension of the lesion be not prevented. Tubercle is deposited near the growing line, either in the form of multiple granulations or in foci. It breaks down and forms pus, and this may, as we have stated, either spread through the bony tissue into the articulation or open on the extra-articular aspect of the bone by a minute orifice, and give rise to a para-articular abscess of considerable size. In many instances the two lines of extension go on simultaneously; in others the para-articular form is predominant, and it is this we wish to consider. Such an abscess is usually situated upon one side of the bone, and spreads out along it. It often covers an entire side of the joint, being separated from it only by the capsular ligament and synovial membrane. Sometimes it is not recognized until it has burrowed its way for a long distance between the muscles and tendons and beneath the aponeuroses. In such instances it is most difficult to discover its connexion with the epiphysial region, and prolonged search is often necessary. But the focus in the bone is often situated at the point of insertion of one ligament of the joint, and this point is of clinical significance, because when that particular ligament is drawn upon pain is elicited. Thus, in one case a boy aged 15 complained of pain only when he stood on one foot with it inverted. The painful spot corresponded to the insertion of the long external lateral ligament into the femur, and a local tuberculosis was suspected. An *x*-ray examination and operation confirmed the finding.

[1] *Albany Med. Annals*, vol. xxvi. No. ?, p. 517. To this writer I am much indebted for some points in this discussion.

Symptoms.—The onset is insidious, and marked only by pain, which is quite different from, and not so continuous as, the pain of joint disease. It is well marked after fatigue, but after a period of rest it subsides entirely. The constant recurrence of pain at a particular spot should draw attention to the fact that there is probably a small focus of disease there. Such an instance occurred in the case of the wife of a medical man I was asked to see.

She complained constantly of pain over the great trochanter, and there was distinct tenderness, but no fullness. Further, the pain was exaggerated in one movement of the hip-joint only—namely, when the limb was fully adducted; all other movements were quite free. This led to the suspicion that there was a focus of inflammation at the base of the great trochanter in the site of the former growing line. An operation was done, and on cutting down upon the painful spot we found an old caseous focus, which was removed. She made a complete and satisfactory recovery.

In many cases of para-articular tuberculosis muscular atrophy is present, although at the same time the movements of the joint are quite free, except in that one direction where the ligaments or the attachments of muscles pull upon the painful spot. This spot is fixed and unvarying, and while other parts around the joint are quite painless, pressure on the diseased area always provokes tenderness. If in this comparatively early age, during which it not infrequently happens that the surgeon's attention is not called to the condition, the bone be carefully palpated, a distinct thickening of the bone may be felt. The thickening is perfectly hard and non-fluctuating; but later, evidence of fluctuation is readily obtained. By the time that enlargement of the bone is evident the lymphatic glands draining the site of the lesion are involved, but as a rule not so much so as when the synovial membrane itself is affected. When the patient consults the surgeon the pain has become more constant, more marked and definite, but is still associated with one movement only as a rule. Muscular atrophy is readily noted, and the thickening near the joint can be appreciated. The swelling, which is hard and circumscribed, now shows extension, and its outline becomes less definite and softer, probably due to extensive involvement of the soft tissues over the bone. Pressure gives rise to acute pain, but so far the neighbouring joint is still free from disease and friction of the surfaces is painless. An *x*-ray examination shows the tuberculous affection to be extra-articular, and clearly defines its outline. The final stage is an involvement of the joint, and occasionally of the medulla.

Prognosis.—In some instances the disease may not advance beyond the early stages, and it becomes encysted. For a long time it may remain dormant, but in adult life may light up again and give trouble, as in the case quoted above. As a rule abscess eventually forms, and with that event the danger to the joint is imminent. The most vital points in prognosis are early recognition and thorough and radical treatment of the tuberculous deposit.

Diagnosis.—It is most important to decide as to whether the joint is primarily involved or not. In the latter case the natural movements are limited or lost with great rapidity, and nearly all, if not all, movements are painful, while rapid atrophy of the muscles is characteristic, and the involvement of the lymphatics is more considerable than in the para-articular form. Contractures set in early, and with them there is often a quick deterioration in the patient's general health. Some reliance should be placed in the matter of diagnosis upon the patient's history. A localized extra-articular pain in such a patient should give rise to the suspicion that we are dealing with para-articular tuberculosis. Syphilis of the bones may cause pain, which is, however, entirely different in character and position. In specific disease pain is nocturnal, and it is generally rather in the shaft than in the epiphysis. The most valuable aid to diagnosis is radiography. Osteosarcomata present in the early stages difficulties in diagnosis, especially if they soften and fluctuate.

Treatment.—At the commencement absolute rest, immobilization and counter-irritation may be of service, but in all except the slighter cases it is imperative to cut down to the bone, evacuate the granulations or pus and thoroughly scrape the cavity, afterwards treating it with camphorated naphthol, or, better still, a solution of chloride of zinc of a strength of 10 per cent. In operating, it is important that the edges of the cavity should be chiselled away until

perfectly healthy bone is reached. On three occasions I have prevented involvement of the hip-joint by early recognition of disease at the posterior aspect of the neck of the femur, and rapid and decisive treatment. In dealing with a large number of bone cases, in the course of exploration for joint disease, all surgeons must have come across this para-articular tuberculosis unexpectedly, and it is often more by chance than otherwise that the joint has been saved. It is evident that we should carefully watch our cases with the objects of making a clear diagnosis and of justifying surgical intervention.

Mr. J. CRAWFORD RENTON (Glasgow) said: In the early stage the diagnosis is of the greatest importance, and is often difficult. *X*-ray photographs done by an expert have given me much help. If the evidence is not sufficient use Calmette's tuberculin eye test, which has greatly pleased me, and in no case has given rise to trouble as regards the eye. The test must be used carefully, as he has advised. As for treatment at this stage, the following is an outline:

(*a*) Bier's bandage, cautiously used, commencing twenty minutes, and increasing to an hour daily. (*b*) Wright's tuberculin vaccine every fourteen days. (*c*) Plenty of fresh air and good food, either at home or in sanatoriums for surgical tuberculosis. It is disappointing that so little has been done towards establishing sanatoriums of this kind, but it is hoped that in the future this will be remedied. (*d*) Extension. Thomas's splints for knee, hip, or ankle are necessary. Coxa vara splint is very useful in hip-joint disease, as it fixes the pelvis and abducts both limbs.

Cases seen early do well, and do not require any operative interference; but they must be kept under observation. *X*-ray photographs are taken from time to time in order to watch progress in the parts affected. If not improving, the foci are removed, and glycerine and iodoform emulsion used to fill the cavity. Mosetig's wax has also been tried with advantage. In the advanced stage in young people where the synovial membrane and cartilage has become affected, and where there is pain on pressure and starting pains at night, treatment consists in extension to reduce flexion and relieve pain, and thereafter, fixation in plaster-of-Paris for the knee or ankle. If it is the hip which is affected Thomas's splint must be used, and a patten applied to the sound limb, the patient going on crutches. When other means fail, operation is essential. In the shoulder fixation helps, but better results are obtained in it by glycerine and iodoform injections or opening the joint and scraping away as much as possible of the diseased part. In the elbow-joint we do not delay operation, for excision is one of the most successful surgical measures that can be employed, and the results are so satisfactory, if properly carried out, that I can with confidence recommend it. It must never be forgotten that in addition to performing the operation correctly, the after treatment, with reference especially to good movement, must be carried out by either the surgeon himself or a skilled assistant.

I have used glycerine and iodoform injections, and also Mosetig's wax in a number of cases, continuing in addition tuberculin vaccine and staphylococcic vaccine where a double infection existed, and the results have pleased me. Excision of the knee-joint is absolutely essential, the tibia and femur being pinned together with steel nails. After healing is complete and the nails removed, a plaster-of-Paris splint is kept applied for eighteen months. In advanced hip-joint disease, I open the joint, scraping away all the diseased structures, removing as little bone as possible. In cases where deformity has resulted after tuberculous disease of the knee or hip joints, accompanied with considerable shortening, I have done operations to straighten the limbs, and by means of the O'Connor extension boot the patient is able to walk without any one being able to recognize the least shortening.

Mr. WARD COUSINS (Portsmouth) said: The treatment of tuberculous disease of the joints is in many respects different from that of every other form of joint disease. The diagnosis of a tuberculous joint is seldom a matter of difficulty. Sometimes the primary position of the infection is obscure, and the early symptoms very insidious; but in other cases the mischief can be traced at once to disease in the respiratory or abdominal organs. In children it is often intimately associated with tuberculous inflammation of bone, and in many chronic cases there are special indications by the presence of granulation tissue and centres of caseation. Sudden disturbance in a joint following slight injury or overwork, and occurring with marked depression of the vital powers, arouses the suspicion of tuberculous infection. In all cases we can obtain much diagnostic evidence from the character of the local changes and the general condition of the patient.

Fortunately the advance of pathology has exercised a very salutary influence over surgical treatment. Tuberculous disease of to-day, recognized as it is as a specific and infectious disorder in all its various manifestations, has placed the hope of arrest on a much broader basis to that which it previously occupied. To-day we can see no reason why a joint should not recover, and the tuberculous infiltration atrophy and ultimately shrivel into a scar, just like a similar deposit in the apex of a lung. If the number of bacilli found on examination in a part are to be taken as an indication of the activity of the disease, then observations are favourable to the conclusion that incipient disease in the articulating apparatus is more hopefully situated than incipient disease in the pulmonary tissue. Under favourable conditions, patches of tuberculous formation may undergo atrophy, and the infiltration around them cease to extend. This arrest is the result of the death of the bacilli, for surely, by their destruction alone the morbid action can be localized and the individual delivered from the danger of a diffused tuberculosis. How, then, can this curative process be established? Experience teaches us arrest is possible by the complete destruction of the specific cause within the affected structures, and that this fortunate issue may be obtained by complete rest and the healthful influence of sunlight, pure air, and good food upon the whole organism. In some cases expectant treatment may be carried out for months by combining protection of the limb in a well-adjusted appliance with healthy surroundings and daily exercise.

Now, in many incipient cases it is a serious question when expectant treatment ought to be abandoned. The early symptoms advance very slowly, and localized tuberculous osteitis often extends at first over a very limited area; but the insidious changes in the joint ends tend to involve the articular cavity. Whenever signs of progressive disease are present no time should be lost in opening up the bone with the chisel or trephine and clearing out the cavity with a sharp spoon or gouge. When a sequestrum is present, it must be removed, and the part regularly and antiseptically dressed. The treatment is tedious, but often the results are excellent.

In primary synovial cases the disease advances slowly, and sometimes ends in well-marked white swelling, with the characteristic changes in the synovial membrane, with thickening and pulpy infiltration. Centres of suppuration follow in the surroundings of the joint, which may involve tendon sheaths and bursae, and end in long fistulae lined with tuberculous granulations. At length active disease may subside, with more or less joint deformity and impaired mobility. In the early stages of synovial disease local injections into the joint, or in the margin of the synovial membrane, have gained a position on the Continent, but I have had very little experience of this treatment. When the stage of quiescence is reached and all active disease appears arrested, the deformity and contraction of the joint cannot be treated by free manipulation without the risk of arousing again the old mischief in the diseased structures. In some cases it is possible to improve the utility of the limb by performing an osteotomy of the shaft of the bone in the neighbourhood of the joint without any interference with the joint itself.

Whenever the indications for surgical treatment are clear, early operation is attended with many advantages. The risk of delay is always in proportion to the progressive and obstinate character of the disease, and timely aid will often prevent its extension. The hope of cure must depend upon the complete removal of the morbid tissue and softening patches in the bones, and the facility with which this can be accomplished rests entirely upon the extent of the local mischief.

Partial arthrectomy, with ordinary surgical precaution, is attended with little risk, even when portions of bone have to be resected. After a free incision in the most convenient position for exploration and carefully defining the

disease, the infiltrated tissue must be excised and the cavity thoroughly flushed with hot water. To ensure rapid union, the surface should be then dried and the wound closed with sutures. The limb must be kept at rest until the healing process is complete. Many operations of partial arthrectomy of the ankle-joint, tarsus, os calcis, wrist, and elbow have, in my own practice, been followed by good results and with almost complete restoration of function. Every case was treated by complete rest until all inflammatory symptoms had subsided. In these operations tendons rarely require division, as they can be removed from their grooves and turned out of the way before exploration of the joint.

Before the operation of resection of any of the larger joints, the constitutional state of the patient demands very careful investigation, together with the extent of the local disease, and the condition of the osseous structures.

The knee is a complex joint, and the removal of the cartilages and section within the epiphysial lines of the femur and tibia cause often very considerable shortening in young subjects before the age of 14 or 15 years. In performing complete arthrectomy, it is my practice to freely open the joint, and to remove as thin a layer of bone as possible from the articulating surfaces. After completely cleaning out the capsule and cutting out with the gouge every infiltration, the patella is divided vertically with the saw, and the bones jammed together as tightly as possible. The periosteum is then sutured with strong catgut, and the wound closed except at the extreme ends of the incision. The majority of my patients have been young adults, but several were over 45, and one at the time of the operation had reached the age of 52 years. One amputation has occurred in a series of forty excisions of the knee. I have often questioned my patients with reference to the inconvenience of the ankylosis, and without exception they have regarded it with indifference.

Mr. Maynard Smith (London) spoke of the results of tuberculin inoculation, and the use of the opsonic index in diagnosis and in deciding as to when a cure had been accomplished. He handed round tables which showed the results obtained in the inoculation department of St. Mary's Hospital in 34 cases which he had observed personally. Of these cases, 21 had been cured, 9 were improving and still under treatment, 2 had only had two or three months' treatment, and 2 had made no improvement after six and ten months' treatment respectively. He advocated strongly the conservative treatment, and deprecated the attempts to eradicate the disease by early operation. (The full tables of cases will be found in the Section of Haematology and Vaccine Therapy, in a paper entitled "The Inoculation Treatment of Tuberculous Arthritis," which will be published shortly.)

Mr. Rushton Parker (Liverpool), after expressing his general agreement with the openers of the discussion, said: The importance of exact diagnosis has been mentioned, it being supposed that the variety of treatment depends on the variety of pathological cause, and the subject of discussion being solely that of "tuberculous joints." No doubt the use of tuberculin and other tests may make it possible to be thus exact in well-equipped clinics, but seldom elsewhere in the hurry of daily work, especially in general practice, where the cases are often first met with. I consider it of infinitely more importance to recognize the early signs of joint disease, and to treat them promptly whatever be the cause, than to attempt a discriminative pathological diagnosis. For instance, an untreated case of hip disease, to the slightest degree, from whatever cause, is recognizable by the unmistakable evidence of muscular rigidity indicated by flexion. As Mr. Robert Jones well says, if there be no limit of movement there is no arthritis; and the same law applies to all other joints.

The mention of mechanical treatment by Sir W. Macewen, though in very few words, may be taken to imply the careful, skilful, and to the best of the circumstances, the efficient attainment of the stillness and rest desired. In his hands, as in the hands of Lord Lister and other skilful manipulators, the application of older-fashioned appliances may have left little to be desired; but such attempts have too often failed, and the attainment of the necessary rest has continued unrealized, in less skilful hands. Even cases ending in what is called "recovery" often present the rigidity referred to as a sign of an "uncured" state.

The great value of the late Mr. Hugh Owen Thomas's splints has been the much more precise and efficient management of the limbs by those who can use the appliances to the fullest advantage in difficult cases, and by many others in slighter cases. There is almost as much superiority in Thomas's splints over the best of all others, as there is in the best of all others over the absence of any apparatus whatever; and the gain to surgery by their use and distribution has been incalculable. It used to be said by some surgeons adopting these splints that their great advantage lay in the liberty afforded to the patient in getting about; and it was a not uncommon report that "after the pain and tenderness had passed off, a Thomas's splint was applied, and the patient allowed to get up and take exercise." But their greatest value really lies in their utility from the very first, during the painful and tender stages, when the patient has to be kept in bed. Later, their effect in still procuring efficient mechanical treatment while the patient gets about, with exercise of the rest of the body in the fresh air, is of great additional value; and, moreover, with these splints all the resources of antiseptic management can be combined.

The achievements of Hugh Owen Thomas by means of his splints impress very forcibly on my mind the greatness of the debt owed by the art of medicine in various ways to the efforts of empirical invention. No scientific process or system of pathology could ever have resulted in Thomas's splints. He devised them after trying every known conventional apparatus, and gradually evolved them by perseverance in the attempt to prevent movement in joints, and by the force of his own mechanical genius, untrammelled by any system of pathology, and undaunted by previous failures or imperfect successes. When he made these known to me about or before the year 1875 I regarded them as a revolution in, and simplification of, our mechanical resources. Though admirable when I first saw them, he quickly made improvements in detail at that early date, and I at once persuaded him to publish them, and thus secure for ever the credit of his invention.

May I stray a moment here to ask a question I have often asked myself and attempted to answer? What is the kind of mechanics most required for the surgeon, especially in the treatment of bones and joints? Not that of the joiner, smith, or engineer, but surely that of the sailor, whose business it is to attach any one thing to some other thing—somehow. This was the kind of mechanics I recognized as eminently present in the manipulations of Mr. H. O. Thomas. In the first years of my use of his splints I, too, paid no regard to the pathological causes of joint disease, but treated all alike mechanically, with a faith in the apparatus that has never wavered. A distinguished surgeon to whom I was showing joint cases fitted with Thomas's splint in Liverpool about the year 1878 remarked that I appeared to hold peculiar views as to the pathology of the affection. He was thinking of one thing to him paramount, while I of another equally paramount to me. Some time later, on the suggestion of Mr. F. T. Paul, who had then succeeded me as Pathologist to the Liverpool Royal Infirmary, I was led to regard numerous spontaneous joint affections, not otherwise explained, as tuberculous, a view that was generally gaining ground. So, on finding most of such cases, some acute, some chronic, assumed to be tuberculous, quickly remedied by purely mechanical treatment, the inference naturally followed "that tuberculous joint disease is capable of resolution under rest secured by fixation." When abscess occurred, especially if in the course of such treatment, it usually yielded to aspiration, once or oftener performed, while the rigid fixation was kept up.

In more recent years, while looking back upon some of these most successful cases, it gradually dawned upon me that such abscesses which could often be recognized as beginning in bone disease, especially of the epiphyses, might probably not be tuberculous at all, and the spontaneous "recovery" not only of joint cases but also of Pott's disease of the spinal column, where health and strength remained and deformity alone persisted, lent probability to the supposition. The question could only be settled by bacteriological examination of the pus when

freshly withdrawn under antiseptic precautions, and when this was done the discovery of staphylococci as the sole organisms left no option but to conclude that periostitis, ostitis, or osteomyelitis of a non-tuberculous kind, often lay at the root of the malady. I can only advise the systematic continuance of such investigation wherever practicable, as a means of some day ascertaining the relative proportions of these pathological varieties. Instead, therefore, of assuming a tuberculous origin for so many joint cases not otherwise obviously explained, but not submitted to a tuberculin test, it is probably correct to assume that a good proportion are not tuberculous at all, and on that account alone may be more hopefully treated. Mr. Robert Jones makes allusion to this when he says that "chronic infective articular affections resemble tubercle. . . ."

As Sir William Macewen has aptly said, "Tubercle in children" (perhaps I might substitute "joint disease in children, whether tuberculous or not") "most frequently begins in the bone, in the epiphysis, rather than in the synovial membrane," and the conservative operative measures so thoroughly devised and so clearly explained by him, such as tunnelling the bone through the synovial membrane or away from it, avoiding the cartilage when practicable, also the intracapsular operation when excision is practised, are worthy of every attention, and, under suitable conditions, of careful imitation. But I should always begin with rigid mechanical fixation in Thomas's splints, or those modifications and improvements in them made by Mr. Robert Jones, as operative measures are thereby so frequently made unnecessary or lessened in scope owing to the reparative effects of early and effective rest. If, in spite of good rest, the local pathological state should be aggravated, it would then be time enough to operate, and in so doing to scoop the bone when entered. In the event of abscess, I agree with Mr. Jones in postponing the opening as long as fairly practicable; since the results of later operation, and even of spontaneous bursting when proper precautions are adopted on the event, are better than those of early opening.

It is impossible for surgeons, accustomed to operate early in the absence of the careful mechanical treatment which alone satisfies the followers of H. O. Thomas, to imagine the extent to which dangers and difficulties are warded off by the early and efficient use of his splendid appliances.

The tests of recovery mentioned by Mr. Jones, but usually omitted from the textbooks, are of almost equal value with the details of early treatment; for next to knowing how to begin it is important to know when to end the necessary treatment. These three points: (i) the detection of rigidity; (ii) the test of recovery, and (iii) the late opening of abscesses, were among the most valuable and original of H. O. Thomas's observations and teachings.

Finally the sanatorium treatment, which Mr. Jones so properly advocates as an adjunct to the strictly surgical management, is highly to be approved. I have also found hospital cases lag and languish until dismissed to fresh-air treatment even in a stage long before the patient could get up for exercise. A few years ago, at a visit to the wards of Monsieur Brunon, physician in the Hospice Générale at Rouen, I was much impressed by the attention paid and the constant trouble taken to effect, and to teach the value of, open-air treatment in all kinds of tuberculous cases, by that strikingly capable clinical practitioner and teacher.

Mr. C. W. Cathcart (Edinburgh) said: I believe that the guiding principle in the surgical treatment of tuberculous joints should be that *tuberculosis is a curable disease*. Clinical experience has taught us that long ago in all forms of tuberculous disease and in joints, especially where rest has been employed. In recent years we have learned to appreciate the value of fresh air from our medical colleagues, while the results of tuberculin treatment of certain gland cases I have observed have been nothing less than marvellous.

From a surgical standpoint, therefore, it seems right to give the first place in the treatment of surgical tuberculosis to natural means of arresting the disease when these means are supported and stimulated by the various methods which modern science can now supply. We cannot afford to ignore any of the methods meanwhile, although in time, perhaps, some of them may be found to render others unnecessary. We have thus at our disposal mechanical rest to the joint, extension in certain cases, passive congestion by Bier's methods, iodoform injection especially of cold abscesses, open air by day and night, and the careful use of tuberculin, with, of course, bodily and mental rest, good food, and other generally accepted remedial measures. Mr. Maynard Smith's contribution to this discussion seems to me to be of great importance.

When, after a fair trial of these various measures, the progress of the disease is not arrested, or when the disease has already advanced so as to make a return to much functional usefulness impossible or improbable, the question of operation will have to be considered. The nature and extent of the operation will depend on the age and constitution of the patient, on the joint affected, and on the locality and extent of the disease in it. In estimating the possible return to functional usefulness, it should be borne in mind that there seems to be a greater degree of return to usefulness in tuberculosis than in other forms of joint affection which have reached an apparently similar stage.

SOME UNUSUAL CASES OF ECHINOCOCCUS (HYDATID) CYST, WITH REMARKS ON DIAGNOSIS AND TREATMENT.

By G. A. Syme, M.S.Melbourne, F.R.C.S.Eng.,
Surgeon, Melbourne Hospital; Examiner in Surgery, Melbourne University.

The diagnosis of unruptured and uncomplicated echinococcus (or hydatid) cysts in their most frequent situations—the liver and lung—is usually easy, especially with the valuable aid given by *x* rays, the shadow on a screen of a cyst in the lung or on the upper surface of the liver being quite typical. When a cyst in the liver has ruptured diagnosis may not be always quite so simple. The rupture may occur into the bile passages, and portions of the cyst or small daughter cysts may pass down the bile ducts, and the symptoms then will closely simulate those of gall stones, as in the following case:

W. W., aged 21, admitted into the Melbourne Hospital on May 1st, 1905, under the care of my colleague, Dr. Nihill, complaining of abdominal pain and vomiting. His temperature was 100° F., pulse 96. He had slight icterus, and the urine contained bile. The abdomen was rigid, especially in the right hypochondrium, which was very tender. The liver dullness extended from the fifth space to 3 in. below the costal margin. He had been suddenly seized with violent pain in the pit of the stomach on April 29th, then had a shivering attack, soon after vomited, subsequently he had frequent loose stools. The case was regarded as one of gall stones, and the nurse was instructed to carefully examine the stools. On May 4th she reported that three bits of yellow "skins" had been passed in the motions I then saw him in consultation; operation for hydatid was decided on and performed on May 5th. The needle of an exploring syringe was introduced in the eight intercostal space in in the mid-axillary line and pus found at some depth. A portion of the eighth rib was excised, the diaphragm incised, and a trocar introduced into the upper part of the liver. Turbid hydatid fluid escaped. The track of the trocar was opened up with a thermo-cautery revealing a cavity full of broken-up daughter cysts and membranes. The contents were irrigated out with saline solution and the cavity drained after suturing the adventitia and diaphragm to the parietes. The patient made a good recovery. In another case, seen recently with Dr. Somers, of Mornington, with very similar history and symptoms, exploration with a needle was negative, and I opened the abdomen over the gall bladder, which was found to be enormously distended, apparently with cysts. By squeezing I was able completely to empty the gall bladder, and then closed the incision. A large number of cysts were vomited as the patient recovered from the anaesthetic, and others were subsequently passed per rectum.

It is doubtful if this was good surgery, but I thought it the safest under the circumstances, as the patient was a long way from town, in an inaccessible part of the country. I proposed later, when he could be moved to town, to operate again, and try to find and evacuate the cyst, but so far it has not been necessary, as he has made an apparently perfect recovery; and when he called to see me in town had no symptoms or abnormal physical signs, and the *x*-ray screen showed no evidence of a cyst. The most frequent method of rupture, however, if such it can be called, is by gradual absorption from pressure through the diaphragm into the lung, when pulmonary symptoms predominate, and the condition may be mistaken for

pulmonary tuberculosis, or new growth; or the chronic bronchopneumonia which is induced may be regarded as the sole trouble. In these cases the *x* rays are less useful, the screen shadow not being characteristic. Careful and repeated examination of the sputa, and the discovery of some abdominal enlargement of the liver will generally elucidate the case. The following may be selected as fairly illustrative:

L. L., aged 51, admitted to Melbourne Hospital October 19th, 1908, with the history that he had been suffering from a paroxysmal cough for the last seven months, at first unaccompanied by any expectoration, and coming on almost every night. Two months previous to admission he began to expectorate—thick, whitish phlegm—and to cough during the day. About six weeks ago blood appeared in the sputa at times, and on one occasion he felt a pain below the right ribs, and then coughed up a quantity of thick, purplish, jelly-like material, with a foul smell. A few days later a swelling was noticed below the left ribs, which increased in size somewhat rapidly. About October 10th he coughed up about a cupful of this purplish jelly, in which were three bits "like grape skins." He also began to vomit after nearly every meal, and lost weight.

On examination the liver dullness extended from the fourth rib to the costal margin in the nipple line, and was continuous with that of a swelling in the left epigastric region; this swelling was firm, elastic, but apparently not fluctuant, moved freely with respiration, and was not tender. In the right lower axilla, and at the right base posteriorly, the percussion note was impaired, vocal resonance and fremitus diminished, breath sounds distant, with some friction, and a few crepitations. The blood count gave 10,000 leucocytes, with 8 per cent. of eosinophiles. Screened with the *x* rays, a patch of irregular opacity was seen in the right axillary region, but not like the opacity of hydatid. No tubercle bacilli could be found in the sputum. The blood was examined for the precipitin test with hydatid fluid, but gave no reaction. (The same hydatid fluid used in four other undoubted hydatids gave no precipitin reaction with their blood.)

On October 28th, under ether, the base of the right lung and the upper surface of the liver were explored with a needle, with negative results. The abdomen was opened over the swelling, which was a hydatid of the left lobe of the liver. It was incised, evacuated, and marsupialized, with drainage. Daughter cysts continued to discharge up to December 19th, when the tube was removed. He was discharged from hospital on December 23rd, having gained greatly in weight, pulmonary symptoms gone, and feeling very well. The incision was all but healed.

Hydatid cysts of the liver may also be ruptured by violence and give rise to anomalous abdominal conditions. Such a case I have reported elsewhere.

But it was the rarer cases, where the echinococcus had invaded structures such as bone, to which I wished more particularly to call attention, where diagnosis is more difficult and treatment less satisfactory. In bone the echinococcus reproduces itself chiefly exogenously in the cancellous structure, resembling in appearance the true multilocular or alveolar hydatid, a form which is never seen in Australia. Professor Watson of Adelaide has pointed out that when the environment of the echinococcus is favourable—as in the lung—the cyst grows spherically, with little adventitia, and rarely forms daughter cysts. On the other hand, when, as in bone, its spherical expansion is mechanically hindered, the parasite expends its energy in reproduction, forming scolices, growing exogenously, and becoming sacculated. The following is a very good instance:

Miss X, aged 24, was admitted to the Melbourne Hospital on July 30th, 1908, complaining of pain in the left buttock, shooting down the left thigh and leg to the ankle, along the outer side of the limb, and of a swelling in the left buttock. She had an attack of what was called "neuritis" in the left lower limb two years before and had been subject to attacks of pain ever since, coming on every two or three weeks, but for the last three months the pain had been constant. She noticed the swelling six months before admission, and it was about the same size then, but at times it got much smaller and almost disappeared. She had lost flesh. Her mother died of chest disease, "had only one lung," and a sister had consumption.

On examination, a swelling was present in the gluteal region, 4 in. in diameter, between the crest of the ilium and the left sacro-iliac joint. It was tense and elastic, and doubtfully fluctuant, lobulated, and moved freely about on the subjacent structures. A slight impulse was obtained on coughing. In the left iliac region, with its centre opposite the anterior superior spine, was an ill-defined, oval swelling, and in the left Scarpa's triangle was another swelling, the size of a small orange, which gave a distinct impulse on coughing and increased in size when the patient stood up. Pressure on the swelling in the iliac region was communicated to that in the groin, and *vice versa*, but apparently not to that in the gluteal region. The movements of the spine and left hip-joint were free, and there was no tenderness along the spine or pain on jarring the spine or squeezing together the sacro-iliac joint. The evening temperature was 99° F. The blood showed 9 per cent. eosinophilia. The tuberculous opsonic index was normal. A skiagraph showed a great rarefaction of the upper ilium and sacrum.

On August 5th, under ether anaesthesia, an incision was made over the gluteal swelling, exposing a hydatid cyst, the adventitia of which was connected to the subjacent bone by a pedicle ½ in. in diameter. The adventitia was dissected out, and this pedicle was found to pass into the sacrum, and a probe entered a cavity in the bone; the sac was full of an immense number of very small daughter cysts. The incision was temporarily protected with gauze, and the patient turned on her back. The swelling in the iliac region was then explored by a muscle-splitting incision and found to contain a quantity of putty-like material and pus. It extended down under Poupart's ligament to the insertion of the ilio-psoas and up along the muscle, undermining the iliacus. The cavity was irregular, but the saline solution could not be freed through the posterior incision. It was plugged with iodoform gauze and dressed, and the patient again turned on her face. The cavity in the sacrum was opened up with gouge and bone forceps, and innumerable cysts and fragments of bone containing cysts gouged out and scooped out with the flushing scoop. The cavities in the sacrum and ilium were very irregular and sinuous. Drainage tubes were introduced and dressings applied.

Next day the temperature rose and remained up for several weeks, with quickened pulse. Cysts continued to discharge, with pus.

On December 15th she was anaesthetized with ether, and more bone and cysts gouged and scraped out of the ilium.

When I left the discharge was diminishing. No cysts had escaped for some time, and she was up and steadily improving. The fragments of bone removed containing cysts show very well the exogenous mode of growth with sacculation. The following was another instructive case:

A. C., aged 40, admitted to the Melbourne Hospital September 14th, 1908. Four years previously he had pains in the right chest fairly constantly, and dull and aching in character, and he felt sick and "generally out of sorts"; he lost flesh and strength. He went to a country hospital, and while there a swelling was found to the right side of the spine, and was removed by operation. He was free from pain for nine months when the pain returned. Four months later the swelling returned, and in three weeks it burst and discharged matter. He gradually lost flesh, got very weak, and a cough developed, with slight expectoration of phlegm.

On examination, he looked very thin and ill. On the right side of the spine, 3 in. from the mid-line, at level of seventh and eighth dorsal vertebrae, was a vertical scar, with a small sinus at its lower end. Above the scar was a movable elongated swelling, firm and solid to the touch. From the sinus was a purulent discharge, in which occasionally were some shreds which proved on microscopic examination to be hydatid cyst. There was slight dullness and diminished vocal resonance in the neighbourhood of the scar but no other abnormal physical signs in the chest. Screened with the *x* rays a slight shadow on the right side of the thorax was seen but no definite tumour.

On September 16th, under chloroform anaesthesia, the old scar was opened up, and the adventitia of an old hydatid dissected out from among the muscles down to the ribs, but no communication could then be found with the thoracic cavity. The wound continued to discharge pus, and a few daughter cysts escaped occasionally. Convinced that there was a cyst deeply situated, on October 25th I again operated under chloroform anaesthesia, making a very free exposure of the chest wall at the upper end of the old incision, and found a small daughter cyst escaping from a small opening near the costo-vertebral joint. A probe passed through this entered the thorax. The adjacent ribs were gouged and cut away, enabling the finger to be introduced into a considerable cavity, bounded in front by thickened pleura and internally by the body of the vertebra, which was irregularly hollowed out and full of exogenously developing hydatid cysts, as was also the transverse process. A quantity of pus and cysts came away. The surfaces of bone were well curetted and gouged, the cavity irrigated, and plugged with iodoform gauze. Pus and an occasional small cyst continued to escape until October 22nd. The discharge of pus gradually ceased, and he left hospital on November 4th.

A very similar case is figured by Professor Watson in his paper on Hydatids in Surgery, Gynaecology, and Obstetrics, June, 1907, in which a hydatid of the vertebral body "beaded forwards between the transverse processes into the thorax, retropleurally," with small cysts in the bone and larger ones in the retropleural space. In Watson's case the cysts had also "beaded off into the spinal canal." In the following case, recently under my care, cysts were present among the spinal muscles, the vertebrae were eroded, and cysts had also formed between the laminae and dura mater, but which of them was primary, or whether they were independent, is doubtful.

M. C., aged 28, was first admitted to hospital on April 26th, 1892, with an ill-defined swelling on the right of the eighth dorsal vertebra. It proved to be a hydatid, closely packed with very

small daughter cysts, and fixed to the lamina of the vertebra. It was dissected out, and also three smaller cysts situated higher up among the vertebral muscles. On May 31st he complained of pain above the incision, and another cyst was discovered and excised.

He was readmitted on May 11th, 1895, and two cysts removed from near the second dorsal vertebra. On March 12th, 1899, a cyst was removed from the lumbar region close to the lamina. The wound suppurated and discharged daughter cysts until April 7th, 1899.

He was readmitted on March 27th, 1904, complaining of a feeling of numbness in both legs as high as the knee, and said that pressure on his back (over the eighth dorsal spine) caused a feeling of tingling in his legs and a pain in his upper abdomen. On examination, no alteration of sensation could be made out, either to touch, temperature, or pain. The reflexes were normal, and no objective signs of any kind could be found.

On April 26th he returned, saying the numbness had increased; the pain in the upper abdomen was more marked when he pressed on his spine, so much so that it hurt him to lie down, and that he occasionally staggered when walking. On examination he had some loss of sensation in his legs, but it was very variable, his knee-jerks were increased and he had a slight stagger on walking, and a slight swaying on applying Romberg's test.

On May 3rd operation under ether, and laminae of eighth and ninth dorsal vertebrae exposed. The right lamina of the eighth was eroded into the canal, and several flattened and much compressed small hydatid cysts were removed from between the dura and the bone. He left hospital June 28th, 1904, with no symptoms.

On January 31st, 1908, readmitted with pain in abdomen on both sides, just below umbilicus, but chiefly on right side, and pain in back in upper lumbar region, and with numbness in his legs and lower abdomen; also the staggering had returned. On examination there was some loss of sensation to light touch, but he could not fix its upper limit, and it seemed very variable. His knee-jerks were now slightly diminished, and his gait very ataxic.

On May 2nd operation and spinal canal opened through eleventh and twelfth laminae, but no cysts were found. After this the symptoms increased. He got rigid spasms, sometimes of the flexors, and sometimes of the extensors of the legs and feet, retention of urine, and gradually increasing loss of sensation up to umbilicus, and some paresis of the legs, especially the right. Patellar reflexes quite absent; no Babinski.

On May 28th, 1908, operation. As the limit of anaesthesia appeared to be at the tenth dorsal vertebra, it was thought the segmental lesion was probably three vertebrae higher. The laminae from the fifth to tenth were exposed, and those of seventh removed, but nothing abnormal found. Those of the eighth and ninth were next removed, and seven cysts were exposed and removed, lying on the dura and much compressed. He gradually improved, and is now practically well.

The value of the precipitin reaction in the diagnosis of echinococcus remains to be seen. Welsh and Chapman[1] proposed this test, and in a paper read at the Australasian Medical Congress at Melbourne they said, "We have evidence of interaction between hydatid fluid and serum from hydatid patients, but we have not been able to find a method of applying the reaction that will hold good in all cases in conditions of diagnosis. A negative test is inconclusive, but a positive reaction is conclusive, and may be obtained in conditions of diagnostic importance." Our experience at the Melbourne Hospital has been limited, but in almost every case we got negative results in cases of undoubted hydatid. The difficulty is to keep the hydatid fluid ready for use as wanted, and even with fresh fluid negative results were obtained.

The presence of eosinophilia is a useful help in diagnosis. Repeated examinations of the blood must be made, as eosinophiles may be in excess at one time and not at another in the same patient.

As regards treatment, no one method is universally applicable; but the treatment most generally satisfactory is removal of the mother cyst and daughter cysts if present, marsupialization of the adventitia, and drainage. Cysts in the soft parts of the parietes may be dissected completely out and the incision closed, also omental cysts; when these are numerous, as is generally the case, repeated operations are necessary, as it is a great mistake to attempt too much at one operation. Care must be taken not to allow the contents to escape into the peritoneal cavity and get into the margins of the incision, as scolices may become implanted there and grow. Of this I have seen undoubted instances. Cysts in the spleen may be treated by removal of the mother and daughter cysts, dropping back the spleen, and closing the abdomen. Some lung and liver cysts, when small and barren, may be treated in the same way, but generally require marsupialization. When liver cysts have invaded the lung, it is important if possible to evacuate the primary cyst through the abdomen.

Suppurating cysts have been almost universally treated by drainage; but Mr. Hamilton Russell has washed out the cyst, then filled the cavity with saline solution, and closed the adventitia closely and also the abdomen. I have never ventured to do this myself, though Mr. Russell reported a successful case. In bone the cancellous tissue containing the cysts must be thoroughly gouged out; sometimes the whole portion of bone must be removed, leaving the periosteum, and in some very advanced cases in the lower limb amputation may be necessary. Such cases, however, are extremely rare.

REFERENCE.

[1] *Lancet*, May 9th, 1908, and *Austral. Med. Gaz.*, January, 1908.

DISCUSSION.

Mr. WARD COUSINS (Southsea) referred to cases of abdominal hydatids of enormous size, simulating ovarian tumours. Many cases of this description have led to errors in diagnosis. A woman came under his care in this condition, and after careful investigation of the pelvis, which was filled with the growth, and also the history of the case, he opened the abdomen and found a universally adherent unilocular cyst, with thick walls, and intimately connected with the under surface of the liver. The cyst contained no secondary cysts and other traces of hydatid disease. The tumour had been stationary for several years. On two occasions he had operated upon subdiaphragmatic hydatid tumours after puncture for diagnostic purposes. Both contained cysts in a necrotic state mixed with stinking fluid, and both patients were in a condition of great exhaustion from septic fever. The operations gave great relief. In evacuating large hydatid tumours of the liver he found that, when the cystic cavity was fully opened, by suspending the anaesthetic and with every precaution around the wound to prevent escape of any of the contents into the abdomen, the hydatids could easily be discharged by the involuntary action of the abdominal muscles.

Mr. SYME, in reply, said that liver hydatids often attained enormous size and occupied the pelvis. He had operated on one case treated by tapping as one of ascites, a tumour which on operation proved to be a cyst occupying the whole abdominal cavity and containing large masses of bilirubin, showing the great age of the parasite.

OPERATIONS FOR LIVER AND LUNG HYDATIDS.

By FRED. D. BIRD, M.S.Melbourne.

OPERATIONS for the treatment of a hydatid cyst of the liver are these:

1. Incisions, removal of the parasites, and marsupialization of the adventitial sac.
2. Incisions, removal of the parasites, complete closure of the parietal wound, no further notice being taken of the adventitia after its incision.
3. Incision, bodily removal of the parasites contained in its adventitial casing. This can only very occasionally be done in cases of pedunculated cysts, cysts attached by a pedicle to the anterior border, or under surface of the liver and floating almost free in the coelum.
4. In a very few cases trocar puncture, with or without aspiration, may be resorted to, rather on account of the condition of the patient than on that of the hydatid. It can very rarely indeed be the operation of choice.

It should be noticed that I have made no mention of removal of the adventitial sac, except where it can be got rid of *in toto*. Any operations involving its partial removal are to be deprecated. It is part of the patient, and will disappear after marsupialization in a very surprising manner, even when very thick. The adventitia often invites partial removal, but the surgeon has nothing to gain by the attempt and may involve himself in difficulties.

With reference to these operations, incision, with removal of the parasite and marsupialization of the cut adventitia, is the operation of choice in most cases of hydatid of the liver. Thus very large and large ones should be treated in this way, suppurating examples also. Small hydatids

and multiple ones are operable by the second method. Adventitia which abut on each other or nearly so allow of the second cyst being opened through the coalescing partitions from the one incised, thus saving another parietal incision. Much depends on the judgement of the operator, as if the hydatids have not "contiguas domos," the intervening portion of liver substance may contain a large hepatic vein, whose incision will cause bleeding very difficult to stop, because any measures have to be undertaken through the vestibule of the adventitia first incised.

The selection of the site for the parietal incision depends on the location of the cyst and its size. As the hydatid element tends to seek the periphery of the organ, and as a large cyst must perforce impinge on the surface of the liver somewhere, it may be stated that most hydatids which have been diagnosed will have reached the surface of the liver somewhere.

It is this somewhere which we wish to incise. A general rule, with some reservation, is that a cyst should be incised at the place where it makes most prominence on the surface, or where its rotundity most impresses the surgeon's palpation. The reservation is that if a hydatid having grown to large size bulges into the coelom by much of its circumference, the greatest prominence on the surface may be far down away from the original nidus in the liver, and with the removal of the cyst and subsequent shrinkage of the fibrous sac, the incision into what was the most prominent place may come to be at much disadvantage. Thus in such a case a site nearer the liver than the most obvious part of the prominence should be chosen. Again, it is obvious that a large hydatid may have so grown out of the liver that its globularity may be satisfactorily attacked from more than one point. This is often found to be the case during operation. The positions for incision are these:

(*a*) The anterior abdominal. The most common.
(*b*) The transthoracic.
(*c*) The subcostal. The least common.

(*a*) The *anterior abdominal incision* should be small. A length of 2 in. is ample in most cases. A larger incision involves present embarrassments and subsequent disadvantages. It is sufficient to be sure of the cyst being immediately beneath the cut in the parietes and the adventitia is easily recognized.

No prospecting is necessary; on the contrary, it is inadvisable, as the single large cyst would alone be dealt with at this operation. A very large incision would be required to even reasonably satisfy oneself that there are no more cysts. My experience makes me very sure of the impropriety of doing much at a time when cysts are multiple. It is better to perform several separate operations than to endeavour to deal with several cysts in one. I have already referred to cysts whose adventitiae are touching or nearly so.

It is to be remembered that the presence of a large cyst may inhibit the growth of another one behind it, and an operation which removes the former may allow the latter to grow, sometimes very rapidly, to the disgust of the patient, but no justifiable operation would prevent this development. I have known of a third cyst appearing in this way.

Allow me to describe the operation I perform for a hydatid cyst of large or moderate size, which allows of being removed by an anterior abdominal wall incision. Under an anaesthesia not deep a small incision is made where Nature gives you so good a lead by the prominence of the wall. As soon as the peritoneum is opened, the white, or yellowish-white, occasionally opalescent, adventitia is seen. A line is picked where no thinned out edge of liver exists, and the knife is plunged into the adventitia, cutting edge upward, with exactly the same firm dig which we impart to it in suprapubic cystotomy.

A gush of fluid usually results (sometimes the hydatid cyst is too full of daughters for this to occur), and a convulsive movement of the patient's abdominal muscles ensues, if he be not too deeply anaesthetized. At this psychological moment the surgeon's left forefinger enters the hole in the adventitia and pulls it up into the wound; he has thus command of the situation, and no leakage occurs into the abdominal cavity, because of the presence of strong intra-abdominal pressure forcing anything to the small opening.

Four or more sutures are now inserted by the surgeon and tied by his assistant; they should include adventitia, peritoneum, and any fibrous structure that is apposite, muscle and skin being avoided. The stitches should be cut long. The mother cyst is removed by forceps, daughters baled out, but no irrigation is used, and no attempt at complete cleansing of the cavity made. A drain tube is inserted into the depths of the adventitia (a great distance sometimes), and the operation area covered by a bulky gauze dressing.

This method by small incision is to my mind much superior to the larger incision with suture of the adventitia before it is opened by the knife. With the large incision the intestines come into the wound, swabs must be inserted to prevent their exit and to keep back omentum, and these get in the way when suturing is being finished. The adventitia being a very tense globe, even a small round needle piercing it leaves a leaking hole, or rather two leaking holes, from which much hydatid fluid spurts. Multiply this loss ten or twelve times (for you have to put in as many stitches as this with the large incision), and a very considerable drain occurs from the cyst, much of which goes into the cavity of the abdomen. Whether this entrance of fluid does harm or not depends on whether reproductive elements are present in it or not, and this we cannot tell at the time of operation.

With the small incision in such a case as I describe, neither intestines nor omentum is seen, no leakage into the cavity is allowed, the manipulations are easy, the danger of sewing in omentum or intestine is *nil*, no swab has to be got out, and the time spent is small, the whole operation being compassed in ten minutes or less. The definiteness of result after this operation is complete. A small scar which is never the seat of ventral hernia remains after the wound has healed in a few weeks, a thin adhesion passes to the former hydatid site in the liver, and this disappears in time, the only sign left of the previous echinococcal presence being a fine white line in the liver.

(*b*) The *transthoracic* route is applicable to cysts situated on the upper surface of the liver. The mortality of its use may be reduced to very small limits indeed by attending to two points: first, let the portion of rib removed be as far forward as possible; in this way, with a good-sized cyst immediately beneath the diaphragm, the pleura covering the diaphragm and the costal pleura will be in apposition and can be treated as one membrane. Secondly, let the surgeon incise freely, as in the anterior abdominal incision; his knife goes through muscle, two layers of pleura, diaphragm, two layers of peritoneum and adventitia. If he uses firmness and his knife is sharp, these various parts become for the moment one tissue; his finger is at once in the cavity of the cyst and he has everything pulled up taut against the ribs, so that he can put in his sutures as if it was only one tissue. In this way leakage into either pleural or peritoneal cavity is avoided and the operation is reduced to the simplicity of the anterior abdominal wall procedure. To suture these various structures in detail is very difficult, nothing is gained, and harm may accrue by admitting air into the pleural cavity in quantity and hydatid fluid into both serous cavities. As it is difficult to be sure absolutely of the cyst being immediately below the costal bed, I always use a small needle or aspirator, to be at once followed by the knife, if it proves, as it very generally does, that the cyst is beneath. The fluorescent screen is of great use in locating the cyst. If we are too far forward another portion of rib may be removed towards the axilla. As a rule the cyst is big when the surgeon sees it, and can be readily attacked from near the cartilage.

There is one instance in which I use a careful dissection rather than a plunge into the cyst, and that is where large veins are seen on the surface of the skin; the diaphragmatic veins are probably also enlarged, and it is safer to dissect alongside the needle or trocar, boring one's way into the cyst. These cases are the exceptions.

(*c*) *The Subcostal Incision.*—This incision outside the line of the gall bladder is occasionally very useful for cysts extending along the lower surface of the liver which are not susceptible to the anterior abdominal incision further forward. It is made parallel with and just below the costal margin. It is awkward in that it cuts across much thickness of muscle, and marsupialization is not

easy. The incision has to be made a good deal larger than the front one, and packing is usually necessary. It is decidedly a more difficult operation than either of the other two. A vertical incision does not afford enough space, as the muscles are thick and the cyst extends away from you; the enlargement of a vertical incision leads you still further from your objective.

Hydatids may be found anywhere in the liver, but there are two positions which are particularly deadly—near the vena cava and in the portal fissure. Those in the former position are very inaccessible, and occasionally burst into the cava with fatal results. When they suppurate, the invitation to operation is great, but I believe the safer course is to wait for an empyema to declare itself, although in the waiting period the patient may die from evacuation into the cava (which is too big a channel to be obliterated by the advancing adventitia), or he may become much enfeebled by prolonged sepsis and persistent cough and bronchitis. However, in the latter case, the opening into the bronchus is very small as a rule; the sepsis is very chronic indeed, and an empyema is by no means an unlikely complication, which, if it occurs, gives the surgeon a good lead by which he may attack the parasite either at once, or better by a second operation after the evacuation of the empyema.

When a cyst growing from the vicinity of the portal fissure attains a fair size, no difficulty is experienced in its treatment, but when it remains small, its adventitia becoming very thick, it is very likely to produce profound jaundice, and the diagnosis becomes as formidable as the treatment. The operation will generally start as an exploratory one; the adventitia, after being emptied, will not approach the surface sufficiently to be marsupialized. We might close the abdomen but for the fact that the adventitia may fill up with serum and bile to such an extent as to render the pressure on the common duct almost as great as ever, or much bile may be extravasated into the coelum. Gauze packing and a drain tube give, I think, the best chance to the patient who is from both a general and a local point of view a bad subject.

A growing hydatid cyst of the lung bursts into the bronchus or pulmonary vessel, or the pleura, or it approaches the costal surface. If it does the latter it lends itself to operation, which consists in the removal of a portion of rib, the plunging of a knife into the cyst through both layers of pleura, the insertion of the surgeon's finger, the pulling up of the adventitia and the removal of the mother cyst (there are only rarely daughters). The further procedure varies according to the condition of the adventitia; if this be tenuous, as it usually is, the surgeon can withdraw his finger and sew up the wound entirely and closely; especially can he do this when the lung expands well and there is no cavity left. Sometimes the lung expanding only partially fills the space previously occupied by the hydatids, then I prefer to put in three or four sutures, mattressing the two pleural layers together before I close the wound entirely. If the adventitia be thick, as sometimes obtains, marsupialization is necessary, the greatest care being taken to attain near to asepsis, as the next day the lung may have expanded so much as to render the tube a superfluity, and the wound may then be securely closed. As in the case of the liver operation, the patient should be but lightly anaesthetized, because, shortly after the plunging of the knife into the cyst, hydatid fluid forces its way up a bronchus, and it is important that none should get down the opposite main bronchus; it is also obvious that the more fluid comes out through the wound the less will there be to go up the bronchus, hence, position and light anaesthesia are important aids.

Sometimes blood is added to the fluid in such quantities as to cause death very soon; the possibility of this should always be explained to the relatives. If more moderate in quantity, morphine and lactate of lime will do much good. The position of the unbroken cyst can be most accurately gauged before operation by the fluorescent screen.

When the cyst has already burst into a bronchus, a natural cure will result if the adventitia is thin and the opening into the bronchus sufficient, so that operation is not needed at once; but if the adventitia be thick, removal of a portion of rib, with incision into the cavity and subsequent drainage are needed, and here the x rays afford valuable aid. When the cyst bursts into the pleura the patient is in a very bad way, and an opening into the pleural cavity in the quickest way is the only thing to do. Later on a large opening may be made, with removal of hydatid débris and further drainage.

It may be noticed that I have made little mention of irrigation. It is inadmissible, I take it, in lung cases. It is unnecessary in live hydatids of the liver, and I am sure it is productive of terrible harm in suppurative cases.

NOTES ON FOUR CASES OF REMOVAL OF THE GASSERIAN GANGLION.

By ALEXANDER BLAYNEY, M.B., F.R.C.S.I.,
Surgeon, Mater Misericordiae Hospital, Dublin.

IN the following paper I propose to give an account of my experiences in four cases in which I removed the Gasserian ganglion for the cure of epileptiform neuralgia, and in addition to make some remarks on the pathology of the affection and the surgical measures which are available for its relief.

As in all essential features the four cases and the procedure which I adopted were alike, I shall give a detailed account of the first only. I shall then indicate briefly the minor differences which existed between this and the other cases.

The first patient was a man, J. D., aged 72, who was admitted to the Mater Misericordiae Hospital in November, 1904, on account of intense pain in the right side of his face. He was a herd by occupation, and had always enjoyed vigorous health till about four years previously. At that time he began to be troubled by a pain which was referred to the molar teeth on the right side of his lower jaw. The pain was very intense and came on at intervals, each attack lasting about half a minute. As the teeth showed evidence of decay they were extracted, but without any relief to the pain. During the two years following the pain gradually extended, involving the remaining branches of the superior maxillary and spreading to those of the inferior maxillary division of the fifth nerve. During the first two or three years there were intervals when he was completely free from pain, but for the two months before admission to hospital the pain was practically constant.

The patient was a rather spare man of good physique. His face presented from time to time an aspect of intense suffering. The pain was strictly unilateral, and was referred to the upper and lower jaw, and the parietal region of the right side. The paroxysms occurred at very frequent intervals, so frequent as to be almost constant. When not present they would be induced by movements of the jaw, as in mastication. When speaking, the lower jaw was kept clenched, and he spoke through closed teeth. Some twitching of the facial muscles took place when the pain was greatest. He was unable to sleep, except for a few minutes at a time; and owing to this, and to the difficulty in mastication of his food, he was in a very exhausted condition. His urine was normal, the heart sounds were good, and his lungs were quite sound.

The case was a typical one of epileptiform neuralgia, which had involved two of the divisions of the fifth nerve, leaving, as is frequently the case, the ophthalmic division free. With such an extensive involvement of the nerve it seemed to me that operations on the peripheral branches of the nerve would be useless, and that the only procedure which gave a promise of complete relief was the removal of the Gasserian ganglion. His advanced age made me hesitate for some time before deciding on subjecting him to this very formidable operation, but I was encouraged to do so by finding that in Sir Victor Hosley's successful cases some of the patients were even more advanced in life. Having determined on the operation, the next question to decide was the method which was to be adopted in carrying it out. Rose's mode of approach to the ganglion was rejected as being difficult of performance and unsatisfactory in its results, many cases having been recorded *in which no ganglionic cells could be recognized in the supposed ganglionic tissue removed*, and in which recurrence of the pain took place.

Consequently the temporal route remained as the method of choice. After a careful perusal of Cushing's

method and experimentation on the dead subject, I decided on the procedure which I followed in all four cases. The main features of this method are the making of an aperture with a trephine as low down as the situation of the zygoma will permit, followed by the removal with a rongeur forceps of the bone down to the level of the base of the skull. I did not divide the zygoma, as recommended by Cushing, but, notwithstanding this, I found it possible to expose the ganglion fully without being compelled to ligature the middle meningeal artery. I cannot too strongly insist on the advisability of becoming thoroughly familiar with the details of the operation on the dead subject before undertaking its performance on the living, as thus one learns to recognize at once the various landmarks and to appreciate the amount of force necessary to detach the fibrous bands which secure the ganglion to its dural sheath.

The actual details of the operation are as follows: The patient having been prepared in the usual manner, received a hypodermic of morphine about a quarter of an hour before being anaesthetized. Chloroform was the anaesthetic selected. Great care was taken that none of the antiseptics used on the skin should enter the eye, which subsequently was kept covered with a sponge moistened with normal saline solution. In order to lessen somewhat the venous oozing which is one of the chief difficulties of the operation, the patient was supported in nearly an upright posture. A flap of skin corresponding to the temporal muscle was now cut and turned down, the muscle being raised with the flap from the underlying bone. An inch trephine was applied and a corresponding portion of bone removed. The aperture was then rapidly enlarged with a rongeur forceps to the level of the base of the skull. The dura mater was elevated, a step which was accompanied by comparatively little bleeding, till the two fixed points at the foramen rotundum and foramen ovale were brought into view. These two points having been clearly identified, an incision was made into the dura on a line between them, thus opening the cavum Meckelii. The aperture was enlarged with a blunt dissector and the clearing of the ganglion was begun, starting from the two posterior nerve trunks. Very considerable bleeding now ensued, which kept constantly filling up the space. After several attempts to check this by pressure the foramen spinosum was plugged with gauze. This lessened the bleeding very considerably and allowed of further clearing. Still the progress was slow on account of the oozing, which required prolonged pressure, each advance in freeing the ganglion having to be followed by pressure for some minutes. At length the upper surface of the ganglion from the ophthalmic branch in front to the nerve root behind could be seen distinctly. The nerves of the second and third divisions were lifted up on a blunt hook and severed. An angled pressure forceps was placed on the ganglion. This was closed, and by a gradual rotating movement the structure was removed, bringing with it the whole of the nerve root. The cavum Meckelii could now be seen to be quite empty. As there was still some oozing of blood a gauze drain was left in and the wound closed. The operation in all had lasted about an hour and a half.

The patient suffered considerably from shock for some hours after the operation, but rallied well towards evening. His subsequent progress was excellent, the pain had completely disappeared when he recovered from the anaesthetic and has not since returned. The only thing calling for comment was the condition of his eye. This was washed out with boric lotion every day and was then covered with lint moistened in the same lotion. About four days after the operation slight ulceration appeared in the cornea which caused me some alarm, but this healed up in a few days more without any change in the treatment being necessary. Anaesthesia was present in the regions corresponding to the distribution of all three divisions of the nerve, and this persists to the present time with but slight diminution of area.

I have received an account of this man's condition in June of this year. He has had no return of the pain, and is in excellent general health.

The second case, Mrs. G., came under my care in February, 1905, about three months after the previous case. She was aged 52, and had suffered from tic douloureux for six years. The pain in her case began in the upper jaw, and for this she had undergone an operation on the superior maxillary nerve, which gave her relief for two years. The pain then returned, and gradually extended to the inferior maxillary division. She had been an inmate of a lunatic asylum for some months between the time of her first operation and her coming to me. The pain was so intense in her case that she had frequently contemplated suicide. Operation was carried out on February 3rd, 1905, on the same lines as in the previous case. There was much more trouble from venous oozing than in the first operation, and in clearing the upper surface of the ganglion I believe I opened the cavernous sinus, as during part of the manipulation there was a gush of venous blood. The bleeding was very free for a time, but was checked by prolonged pressure. After the operation this patient had paralysis of all the ocular muscles, which disappeared after about a fortnight. There was no tendency to corneal ulceration, and I am rather of opinion that the ptosis from which she suffered for some time had served as a protection to the eye.

I have recently received a letter from this woman's husband, saying that she is in excellent health, has been quite free from pain, and has never shown any symptoms of mental aberration since the operation.

The next patient, Mrs. M., was operated on in December, 1905. She had suffered for five years from pain, which began in connexion with the branches of the inferior maxillary division, and subsequently extended to the superior maxillary. In carrying out the operation, the subdural space was opened in making the incision to open the cavum Meckelii. There was a discharge of cerebro-spinal fluid for a few minutes, but the subsequent progress was unaffected by this. I have not been able to trace the subsequent history of this case, but she left the hospital quite well and free from pain.

The last patient was a man, J. D., aged 52, who had suffered from tic douloureux for eight years. He was operated on in December, 1905. Both superior and inferior maxillary divisions were affected. There were no special features to record in connexion with the operation. He has had no recurrence of the pain since he was operated on.

In all, four cases have been operated on, with no mortality and complete relief to the symptoms, which relief I know has persisted to the present time in three of the cases. The subsequent history of the other case I do not know, but I have no reason to think that any recurrence of the pain took place.

The ganglia removed were submitted to Dr. McWeeney, who found evidence of pathological change in all four. In one of them there was a marked increase of connective tissue, with patches of small-celled infiltration. The capsules of the ganglion cells were thickened, and there were changes in the nucleus of the cells. In addition numerous corpora amylacea were present, which were not seen in normal ganglia which were examined for comparison. These changes correspond to those which were found by Spiller in a number of ganglia examined by him for Keen. They would seem to indicate that a process of chronic inflammation, spreading from the periphery, had involved the ganglion. The view of the pathology of this affection which is generally adopted is that the disease begins as a peripheral neuritis in one of the divisions of the fifth nerve, which gradually creeps centrally till it involves the ganglion. The inflammatory process then spreads, involving the cells of the nerve fibres of the remaining divisions. What the exact seat of the pain is is difficult to decide, but it would seem to me probable that it arises in connexion with the nerve-cells of the Gasserian ganglion which are receiving abnormal impulses from the periphery. This view would be in accordance with the facts observed in connexion with the operations for removal of the ganglion and in those for the removal of the peripheral nerves. In the former case, the ganglion cells being removed, the pain ceases at once. In the latter the abnormal impulses are cut off, but the ganglion cells being in a state of irritability only gradually return to their normal condition, and hence for some time after the operation pain is experienced. Under this view, if one could prevent restoration of nerve connexion after the peripheral operation a permanent cure might be hoped for. Hence the procedure of Abbé, who resects intracranially portions of the second and third divisions and then interposes a sheet

of rubber tissue between the ganglion and the cut ends, has much to recommend it. It is much easier of performance than the removal of the ganglion, and Abbé has reported cases in which recurrence had not taken place after intervals of two or three years. With regard to the treatment by injection of alcohol or osmic acid, these seem to act by causing a degeneration of the nerve fibres. But the physical continuity of the nerve not being interfered with, it would seem to me highly probable that restoration of nerve conduction would follow, more especially when we remember that complete restoration of some inches of nerve has been proved to have taken place after peripheral operations.

In the four cases which came under my charge the two posterior divisions of the nerve were involved, and consequently I did not think that peripheral operations held out any hope. The only procedure promising a certain cure which was known to me at the time was the removal of the Gasserian ganglion. Although I was aware this operation had a very distinct mortality (10 per cent.), the melancholy condition of the patients seemed to me to justify the undertaking of this very formidable operation. It may be that further experience of the method of Abbé will establish it on a firm basis, but for the present the removal of the Gasserian ganglion is the only method which certainly promises a permanent cure for this frightful malady.

ON THE SCOPOLAMIN-MORPHINE NARCOSIS.

By Charles Leedham-Green, F.R.C.S.,
Surgeon to the Queen's Hospital, Birmingham.

Two years ago, at the Annual Meeting at Exeter, I gave my opinion of the value of spinal anaesthesia, and emphasized the fact that I regarded it as almost ideal from the *operator's* point of view. My experience since that time only confirms my previous favourable opinion. The more I use it the more convinced I am of its value, safety, and efficiency. From the point of view, however, of the *patient*, it cannot be denied that spinal anaesthesia leaves something to be desired. For, probably, the majority of patients, if given the choice, would prefer to be oblivious as well as insensible to pain at the operation. Nay, more, they wish to become unconscious before anything is done and not to wake up again until all is over and they are once more back in bed.

From this point of view spinal anaesthesia leaves much to be desired. The injection itself is slightly painful and can only be given immediately before the operation, and though the anaesthesia is complete and of sufficient duration for the performance of all operations, it rather excites than deadens the cerebral activity while it lasts, and when its action passes off it does so suddenly, leaving the pain of the wound unmitigated by any anodyne. It cannot, therefore, be regarded as an ideal anaesthetic from the patient's point of view. In order to be that, it is necessary to have some means of so influencing our patients that they become not only perfectly anaesthetized and oblivious at the time of the operation, but also that this condition should last, at any rate in part, for some hours afterwards.

It is perhaps difficult for a surgeon to enter fully into the feelings of a sensitive patient at the time of an operation. Knowing that the operation itself will be painless, and that the healing of the wound will be rapid and unaccompanied by fever or other trouble, he is apt to forget the physical and mental distress which the patient experiences before and after the ordeal. But those of us who have had the misfortune of learning by personal experience the real feelings of a patient on this point, will probably have a vivid recollection of the horror of the long, sleepless night before the operation, the discomfort of the early morning preparations, and the nerve-racking time of waiting for the arrival of the surgeon, followed by the suffocating bewilderment of the anaesthetic, and the return (all too soon) to consciousness, nausea, and the feeling of pain and general discomfort. No, even under favourable circumstances, the twelve hours immediately preceding and succeeding a major operation are anything but pleasant.

Within the last few years a mixed form of narcosis has gradually been evolved which materially reduces these discomforts, and more nearly approaches the ideal anaesthetic from the patient's point of view. I refer to the scopolamin-morphine narcosis, which was first introduced by Schneiderlin in 1900, but has since undergone considerable modifications and improvements at the hands of Korff, Kümmel, and others. This form of anaesthesia has hardly received the recognition it deserves in this country, and therefore I have ventured to lay before you my experience in its use.

When the method was first introduced it was hoped that it would prove capable of producing such a deep slumber that the operation could be carried out without having to resort to chloroform or ether. Experience, however, soon showed that the production of so deep a coma was accompanied by a certain amount of danger, especially in the case of debilitated patients, and that it was not advisable to administer more of the drug than was sufficient to produce a drowsiness, or light sleep, as a preliminary to the administration of chloroform or ether.

The reason for giving both scopolamin (hyoscin) and morphine is to obtain a maximum of the hypnotic effect common to the two drugs, and a neutralization of their toxic action. Scopolamin is an alkaloid of the atropin group, having many of the properties of atropin, but differing in that it produces a marked lowering of the irritability of the cerebrum. Unlike atropin, in small doses it causes a slowing of the pulse. The peripheral blood vessels are dilated, thus producing a certain redness and warmth of the face. Like atropin, it inhibits the secretion of the salivary and mucous glands—an action which is of great value in lessening the dangers of broncho-pneumonia. The anodyne and narcotic action of the second component, morphine, is too well known to need description. Under its influence the breathing becomes reduced in frequency and depth, the pupils contracted, and the mucous secretion, if anything, slightly increased.

The chief difficulty in the use of this form of anaesthetic has been to determine the proper dose to administer. As I have said, it was at one time hoped that the drugs might be given in sufficient quantity to produce a sleep deep enough to permit of the performance of even major operations. In robust patients this can usually be done without difficulty, and I have several times removed even large bronchoceles without awakening the patient. But experience soon showed that the administration of scopolamin and morphine in sufficient doses to produce deep narcosis was attended by danger, and the use of these drugs for this purpose has been universally abandoned. All that is now sought is the production of a drowsiness, or light sleep, as a preliminary to the administration of chloroform or ether. As the action of both the alkaloids, especially scopolamin, varies with the individual, it is found advisable to give it in small repeated doses until the desired effect is produced.

The method which I now use is as follows: The night before the operation the patient is given 10 grains of veronal or bromural, in order to ensure a good night's rest with unbroken sleep—the best preparation for the ordeal. An hour and a half before the operation takes place a subcutaneous injection of morphine $\frac{1}{3}$ grain, and scopolamin $\frac{1}{150}$ grain, is administered. The room is darkened and the patient told to go to sleep. The effect of the injection is immediately to produce a pleasant feeling of drowsiness, in which all fear of the impending operation is lost; and a little later the patient falls into a light sleep from which he can easily be aroused, but only to fall asleep again when he is left alone. If, at the expiration of an hour, the patient is neither asleep nor feeling decidedly drowsy, another injection of morphine $\frac{1}{12}$ grain, scopolamin $\frac{1}{300}$ grain, is given. In the case of women and debilitated patients slightly smaller doses are given, whereas robust men may sometimes with advantage be given a larger second dose than the one mentioned above.

The solution of scopolamin is very liable to undergo decomposition, and should therefore be freshly prepared on each occasion. It should not be mixed with the morphine solution, but the two alkaloids given separately. The manufacturing chemist, Riedel, makes up a special preparation, called "Skopomorphin," in which both the alkaloids are present in a sterilized form, which is very convenient for use, and which has proved most satisfactory in my hands. The only disadvantage is that the proportions of

both the scopolamin and morphine are fixed once and for all and cannot be varied to suit the special needs of the case. An hour and a half from the time when the first injection was administered a general anaesthetic is given in the usual way. Chloroform, or a mixture of chloroform and ether, may be used to start the anaesthesia, and then as soon as consciousness is abolished, replaced by pure ether. Owing to the effect of the scopolamin and morphine, the inducing and maintaining complete anaesthesia is singularly rapid and easy. There is no struggling or choking on the part of the patient, very little of the anaesthetic is required, and the rapid change from a condition of deep to partial anaesthesia, with its accompaniment of struggling and straining, is avoided. Another most valuable consequence of using scopolamin-morphine is that it prevents the excessive mucous and salivary secretions which so frequently accompany and follow the administration of a general anaesthetic—particularly in the case of ether.

The frequency with which bronchopneumonia follows the use of ether has long been largely attributed to the aspiration of this mucous secretion, and consequently it is hoped that by means of using scopolamin-morphine the risk of this serious after-effect will be considerably diminished. Already evidence in support of this claim is accumulating.*

The beneficial action of the scopolamin-morphine injection is perhaps even more marked after the operation. For, owing to its administration, the patient, instead of rapidly waking up to pain and discomfort, quietly passes into a peaceful sleep of several hours' duration.

Lastly, the justly-dreaded post-anaesthetic vomiting is either absent or, at any rate, reduced to a minimum. I have accurate notes of the last 80 of my patients who have been anaesthetized by this method. In 72 of these cases no vomiting took place; of the rest, in 4 the vomiting was very slight (generally limited to a single effort), and in only 4 was there repeated vomiting, and in these the nature of the operation (such as exploration of the kidney, gastric ulcer, intestinal obstruction) was likely to produce sickness.

In the case of patients who have undergone an operation on the abdomen this marked diminution in the liability to post-anaesthetic sickness is in itself sufficient to justify its being called "the humane anaesthetic." It may be convenient to summarize the advantages of the scopolamin-morphine injection briefly. They are as follows:

1. The patient is spared much nervous tension while being prepared for and awaiting operation.
2. He is already drowsy when the general anaesthetic is administered, consequently the full narcosis is quickly and easily obtained without distress.
3. The amount of general anaesthetic (ether or chloroform) required is greatly reduced.
4. Full anaesthesia with perfect muscular relaxation is quickly obtained and easily maintained. Moreover, there is no sudden passage from full to semi-anaesthesia with its accompaniment of struggling on the part of the patient.
5. The secretion of mucus is lessened, and consequently the administration of ether facilitated, with diminished risk of post-operative pneumonia.
6. Absence of vomiting.
7. The operation is followed by a long and peaceful sleep.
8. Increased safety.

On the last-claimed advantage it is necessary to say a few words, for on its substantiation the general adoption of the method must ultimately depend. For should further experience go to show that the scopolamin-morphine narcosis is less safe than the simple ether, or chloroform-ether, anaesthesia, then all its other advantages would not justify its employment.

At the annual meeting of the German Surgical Society in Berlin last April, Professor Neuber, of Kiel, presented the anaesthetic statistics of the large German hospitals for last year, and compared them with those collected by Gurlt from the same sources from 1890 to 1897.

The figures were most interesting, and, as they are most scrupulously compiled, are probably the most authoritative statistics we have on the present mortality from general anaesthesia. The statistics for the years 1890–1897 were as follows, according to Gurlt:

1890 to 1897.	Cases.	Deaths.
Chloroform	240,806	116=1 in 2075
Ether	56,233	11=1 in 5 12
Chloroform and ether ...	15,226	2=1 in 7613
Billroth's mixture	6,740	2=1 in 3370
1908.		
Chloroform	20,613	10=1 in 2060
Ether	11,859	2=1 in 5930
Chloroform and ether... ...	10,232	3=1 in 3410
Billroth's mixture	2,791	4=1 in 698
Scopolamin-morphine ...	23,809	5=1 in 4762
	Anaesthetics.	Deaths.
1890 to 1897...	319,005	131=1 in 2435
1908	71,052	24=1 in 2959

It will be noticed that the ether narcosis is increasing in favour in Germany. But I wish to draw attention to the mortality-rate of that anaesthetic. It will be seen that, with the exception of a slight improvement in the ether statistics, the figures for chloroform and chloroform-ether mixtures are not so good as they were in the period 1890–7. That is to say, the large adoption by the German surgeons of the Roth-Dräger apparatus, whereby the proportion of ether and chloroform vapour is regulated with scientific accuracy and duly mixed with oxygen gas, has not led to that improvement in the mortality which was expected.

The mortality of 1 in 4,762 in the scopolamin-morphine narcosis is extremely good when we remember:

1. That the method is quite in its infancy, and many surgeons have undoubtedly been administering unduly large doses of the drugs.
2. That the grave respiratory after-effects, which so frequently follow the use of simple ether, are absent in the case of scopolamin-morphine narcosis.

It is my opinion that in this mixed form we have not only the most humane, but also the safest, of general anaesthetics.

DISCUSSION.

Dr. Clement Dukes (Rugby) said that he had used the method freely, and valued it most highly. He asked the author why he gave veronal the night before rather than scopolamin and morphine.

Mr. Leedham-Green, in reply to this question, said it was a routine he had adopted from previous workers.

A RECENT SERIES OF 212 CASES OF TOTAL ENUCLEATION OF THE PROSTATE,

WITH SPECIAL REFERENCE TO OCTOGENARIANS.

By P. J. Freyer, M.A., M.D., M.Ch.,
Consulting Surgeon, the Queen Alexandra Military Hospital; Surgeon, St. Peter's Hospital, London.

Eight years have now elapsed since, in the British Medical Journal of July 20th, 1901, I brought my operation of total enucleation of the prostate for radical cure of enlargement of that organ to the notice of the profession. At several meetings of the Association I have placed the results of my work in this direction before the members, and at the Exeter meeting in July, 1907, I gave a review of 432 instances of the operation, my entire experience up to that date. Since then I have operated on a further series of 212 cases, the results of which I will briefly place before you to-day. In the brief time at my disposal it is impossible to deal with more than some limited aspects of the subject. I propose, therefore, directing your attention mainly to two very important applications of the operation—namely (1), to the case of

* Kümmel (*Verh. d. Deutsch. Gesellsch. f. Chir.*, 1908) reports that since using the scopolamin-morphine narcosis the frequency of post-operative pneumonia in his clinic has fallen from 2.5 per cent. to 0.61 per cent.; v. Eiselsberg (*Wiener klin. Wochenschr.*, 1909, No. 13) also notices a marked reduction in the occurrence of post-operative pneumonia. His figures were 3.3 per cent. formerly, and now, since using scopolamin, only 0.9 per cent.

octogenarians, and (2) to the case of very large prostates. I feel that I shall best convey my impressions on both these subjects by, in the first instance, giving details of a limited number of cases from this series, several of which illustrate both the subjects under notice.

CASE 444.

A., aged 81, sent by Dr. E. D. Cave, Bath, October 3rd, 1907. Prostatic symptoms nine years; retention of urine six years ago relieved by catheter. A year later retention again in Italy; aspirated suprapubically by a French surgeon at Nice. After this employed the catheter, but only occasionally. Has had repeated attacks of cystitis, a prostatic abscess, and septic pneumonia during last two months, but no catheter employed, though he has had intense frequency of micturition with pain along the urethra. I failed to pass any kind of instrument into the bladder. Prostate enormously enlarged per rectum, bilobed, soft, smooth, and movable. General health bad. Under an anaesthetic on October 4th, 1907, I failed to pass any soft catheter; metal catheter manipulated into the bladder with much difficulty; 16 oz. filthy urine drawn off; suprapubic cystotomy; no stone in bladder. I then enucleated the prostate entire with much difficulty, as it was unusually adherent to the surrounding tissues. The prostate is of a peculiar shape, flattened transversely to the axis of the urethra, but very broad; weight 6¾ oz. Uninterrupted progress for three weeks, when the temperature rose for a few days to 102° F. Saw Sir Thomas Barlow in consultation; we could detect no cause for the rise in temperature.

Though the temperature subsided progress was slow, and the wound, though clean, did not finally close till the beginning of December. On July 11th, 1909, he wrote: "I am very well, and have no trouble in any way with my bladder; I can walk two and three miles daily."

CASE 485.

B., aged 80, seen with Dr. Maynard, London, December 26th, 1907, for retention of urine. Catheter passed and over 3 pints of urine drawn off. Prostatic symptoms had existed three or four years. Prostate felt much enlarged per rectum and movable. The patient being entirely dependent on the catheter from December 26th, I enucleated the prostate entire on January 3rd, 1908, its weight being 3½ oz.

The patient made an uninterrupted recovery, passed some urine naturally January 15th, and the wound closed on January 19th. On February 11th he left the home able to retain and pass his urine normally.

CASE 486.

C., aged 84, seen with Dr. R. M. Hugo, Purley, January 2nd, 1908. Prostatic symptoms for ten years. Retention of urine on December 25th, 1907; relieved by catheter, which has been employed two or three times daily since then. Prostate enlarged, bilobed, soft and movable. Residual urine 9 oz., clear and acid. On January 4th I enucleated the prostate entire in three and a half minutes, weight 1¾ oz.

Save that the suprapubic wound was slow in closing there was no unfavourable symptom. Passing all his urine naturally by February 17th. On February 25th he went home in excellent health, passing and retaining his urine normally. On July 24th, 1909, he wrote that he was free from all urinary troubles.

CASE 500.

D., aged 74, seen at Maidstone with Dr. Charles Hoare, February 13th, 1908. Usual prostatic symptoms for fifteen years; threatened retention of urine frequently. Catheter used twice daily for a fortnight. I drew off 8 oz. of residual urine, faintly acid and of fishy odour. Prostate enormously enlarged, soft, bilobed, movable. General health indifferent. On February 20th I enucleated the prostate entire, Dr. Hoare assisting. The prostate, which weighed 7½ oz., presented a large median projection in the bladder and was easily enucleated. Progress uninterrupted except by a slight orchitis which yielded easily to treatment.

On April 13th the patient left for the country in good health, retaining and passing urine as well as he ever did. On July 13th, 1909, he wrote: "I can report favourably on my old troublesome organs. I have no trouble in passing urine."

CASE 514.

E., aged 85, consulted me on April 13th, 1908, on the advice of Dr. Pryce Mitchell, of Monte Carlo, and Dr. E. F. Travers, London. Haematuria thirty years previously; sounded with negative result by the late Sir H. Thompson. Prostatic symptoms for twenty-five years, during which he had been in the hands of various surgeons. Entirely dependent on the catheter for seven years. Several attacks of cystitis and haemorrhage. During the last three or four years condition very pitiable, the catheter being employed six or seven times daily. Frequent failure to pass the catheter; waits and then tries again. A few days before I saw him he failed to pass the catheter at Monte Carlo, though he made seven or eight attempts to do so. Eventually called in Dr. Mitchell and a French surgeon, and a catheter was introduced after nine hours' retention of urine, during which the patient suffered fearful agony. After this was so ill that he had to be accompanied by Dr. Mitchell from Monte Carlo to London to undergo operation. I found the prostate enormously enlarged, filling the bladder and rectum, bilobed, soft and movable. Urine alkaline, containing pus; specific gravity, 1010. For years he had suffered from profuse urethral thick discharge of pus. On April 15th I enucleated the prostate entire in six minutes, Dr. Travers and Professor Spencer of the Army Medical School being present. Two-thirds of the prostate lay in the bladder, the lateral lobes being symmetrically prominent, with large median tongue-shaped outgrowth; weight 11 oz. There was scarcely any bleeding and no shock. The temperature remained normal for fifteen days and the wound quite clean. On April 30th the temperature rose to 101° F., and the patient complained of intense pain in the right side of the head, which continued till May 6th, when an abscess burst in the ear. This incident retarded the closing of the wound. Some urine passed naturally May 20th; wound dry May 28th. On June 5th he left for the seaside, able to pass and retain urine as well as he ever did. About a fortnight after his right mastoid was successfully trephined for abscess by my friend, Dr. William Hill.

On July 23rd, 1908, he came to see me in excellent health, passing his urine, which was normal, naturally as well as he ever did, and retaining it five hours. On July 15th, 1909, he wrote: "So far as the prostate operation is concerned, it has been an unqualified success. The flow of urine is perfect." I saw this gentleman next day; he was in excellent health, untroubled by any urinary symptom.

CASE 527.

F., aged 72, seen with Dr. Sandford Smith, Eltham, May 27th, 1908, suffering from prostatic symptoms twelve years. Retention of urine in 1901; catheter employed since then; entirely dependent thereon for six years. Some haemorrhage nine months ago. Catheter causes much pain, and some bleeding. I drew off 10 oz. urine containing some pus; specific gravity, 1025. Prostate extremely large, bilobed, smooth, movable, easily felt bimanually. General health fair. On June 1st, 1908, Drs. Smith and Habershon being present, I enucleated the prostate. It presented a large median outgrowth in the bladder; weight 9¾ oz. On June 16th some urine was passed per urethram, and entirely in this way on and after June 18th.

He went home in good health on July 3rd, able to retain and pass urine naturally as well as ever. I have recently seen this patient; he is in excellent health, able to retain and pass urine naturally as well as he ever did, and looks ten years younger than his age.

CASE 545.

G., aged 86, seen with Dr. Fyson, St. Leonards-on-Sea, July 15th, 1908. In 1896 had haematuria, after retaining urine for a long time. Repeated attacks of haematuria during past two years, increasing in frequency and intensity lately. Scarcely any increase of frequency in micturition, but some pain in the penis during the act. Residual urine 6 oz. Prostate much enlarged, bilobed, smooth, dense at points; felt bimanually to be fairly movable. Loss of flesh during previous year. On July 17th I enucleated the prostate at St. Leonards, the time occupied by the operation being three minutes. The gland was unusually adherent on the left side, but came away entire; weight 2¾ oz. On microscopic section, found to be a benign adenomatous growth, though suspicions of incipient malignancy were entertained by me before removal.

He made an uninterrupted recovery, and commenced to pass urine naturally July 31st; the wound was dry by August 2nd. This patient wrote, July 17th, 1909: "I am glad to tell you I am very well indeed, and have no trouble whatever in the matter you asked me about" (the power of passing and retaining his urine).

CASE 582.

H., aged 70, seen with Dr. Richmond, Wimbledon, November 4th, 1908. Had an attack of influenza in March, 1890, and shortly after, in April, retention of urine, which was relieved by the catheter. Cystitis with high fever followed. Entirely dependent on the catheter for eighteen and a half years, during which patient has had innumerable attacks of cystitis with rises of temperature to 104° or 105° F. Repeated attacks of haematuria, the haemorrhage in August, 1908, being very profuse. Latterly, much difficulty in introducing the catheter, which passes in 16 in. before urine flows. I drew off 16 oz. of urine, which contained pus and mucus with a considerable deposit of albumen. The prostate was enormously enlarged, filling the bladder and rectum; bilobed, dense, smooth, movable. On December 7th, 1908, Drs. Richmond and Pocklington being present, I enucleated the prostate entire. I found that the prostate (Fig. 1), presented an enormous gutter-shaped outgrowth in the bladder, formed by the lateral lobes, which were separated in front by a deep cleft. The enucleation was easy only for the difficulty of reaching the distal aspects of the growth adjacent to the rectum.

Time occupied by operation, seven minutes, very little haemorrhage or shock. Not an unfavourable symptom for twelve days, during which the temperature remained normal. It then gradually increased to 102° F., when I had the advantage of Sir Douglas Powell's advice. A pneumonic patch was found at the base of the left lung. There was also tenderness in the left loin. Temperature normal on December 31st; some urine was passed per urethram December 28th, and entirely in this way on January 7th. In washing out the bladder I detected some small phosphatic concretions. These I crushed and evacuated by the aspirator on January 21st, without the aid of an anaesthetic. Next day there was a rigor with sharp rise of temperature, which was normal again on January 23rd.

On January 27th the patient went home, able to pass and retain his urine naturally, as well as he ever did, after eighteen and a half years' complete dependence on the catheter. On February 12th he wrote: "I could walk six or seven miles without difficulty." On July 9th he wrote: "I make and retain my water thoroughly satisfactorily." In fact, he can go for nine or ten hours without passing urine, and then pass it in a full and strong stream. The bladder is so capacious that on one occasion he retained and passed with ease 33 oz.

The prostate (Fig. 1) is a fine specimen, weighing 17 oz., the lateral lobes being symmetrically enlarged. You will observe that it was removed entire, without a single tear in the capsule. It is open along the anterior commissure, so that it was delivered from the bladder like an open oyster, the left lobe coming first, then the median bridge, and lastly the right lobe, thus avoiding the necessity of making a very large wound in the bladder and abdominal wall.

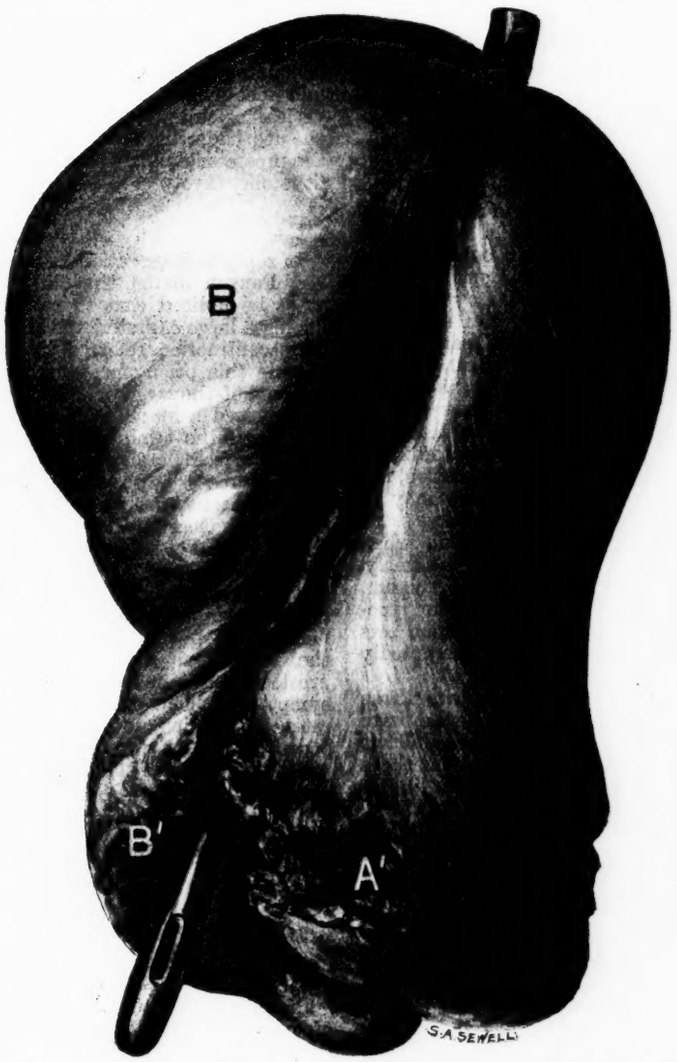


Fig. 1.—Prostate weighing 17 oz., removed from a patient aged 70 (Case 582). A, Right lobe; B, left lobe; A', B', outgrowths of these lobes in the bladder.

CASE 583.

K., aged 80, seen with Dr. Ruck, Ealing, November 30th, 1908. Prostatic symptoms for eleven years. Consulted a London specialist nine years ago, who proposed castration for cure of his disease. The patient did not relish this, so kept clear of specialists since then. Now has intense frequency of micturition, every quarter of an hour night and day, so that he cannot sleep. I drew off 8 oz. of stinking urine by the catheter. Prostate much enlarged per rectum, bilobed, soft, movable. On December 8th I enucleated the prostate (weight 2½ oz.) entire, Dr. Ruck assisting. Recovery uninterrupted. Passed some urine naturally December 22nd, and wholly in this way on and after December 23rd.

He went home on January 11th in excellent health, passing and retaining his urine normally. He is now in good health, untroubled by any urinary symptom.

CASE 597.

L., a retired army surgeon, aged 80, had internal urethrotomy performed in 1862, and again in 1880. Bougies passed periodically, but during last two years could not get them beyond the prostate. Usual symptoms of prostatic enlargement for two or three years; now intense frequency of micturition, particularly at night. Bladder much distended, but I could pass no instrument, owing to a narrow stricture in the bulbous urethra, admitting a catheter No. 4, which impinged against the prostate. Per rectum the prostate was felt much enlarged, bilobed, smooth, and movable. On February 12th, 1909, the patient being anaesthetized, with much difficulty I manipulated a No. 5 steel sound into the bladder, and then rapidly dilated the stricture to No. 8, when I performed internal urethrotomy, a No. 15 steel sound passing with ease immediately after. I then enucleated the prostate, which weighed 1¾ oz. On February 25th some urine was passed naturally, and on March 5th the suprapubic wound was dry.

On March 22nd the patient went home, passing and retaining his urine as well as ever. On July 15th he writes: "My general health is good. I can empty the bladder naturally though the stream is small" (due to the stricture).

CASE 621.

M., a physician, aged 77, seen with Dr. Latham, London, May 10th, 1909. Prostatic symptoms for twenty years; catheter employed since 1895; entirely dependent thereon for the last six years. Sounded by two different surgeons with negative result. During last four years much bleeding, repeated attacks of cystitis, and gradually increasing difficulty with the catheter. Can now pass only a No. 6, which passes in 16 in. before urine flows. Prostate enormously enlarged, the size of a cocoa-nut, filling the rectum; quite soft, smooth, and movable. General health fair. On May 13th I enucleated the prostate, Mr. Pendlebury of St. George's Hospital being present. On opening the bladder suprapubically the prostate was found globular, the lobes being symmetrical, with the urethra in the form of a deep slit between them. About two-thirds of the prostate lay in the bladder and one-third outside. Enucleation was quite easy, save that the distal portions towards the rectum were reached by the finger in the bladder with difficulty. The lobes opened along the anterior commissure, and the prostate was delivered entire through the wound, like an open oyster. There was considerable haemorrhage during the enucleation, but this ceased on delivery of the prostate. Time occupied by the operation, nine minutes. The patient was rather collapsed shortly after transfer to bed, but in the evening the pulse was strong and regular. Uninterrupted recovery. Passed 6 oz. urine, June 5th; wound dry and all urine passed naturally, June 7th.

On June 28th the patient left the surgical home in good health, passing and retaining urine naturally as well as ever. The prostate, you will see, is a fine specimen of globular shape, removed without a rent, and weighing just a pound. This gentleman came to see me on July 22nd when passing through London, in good health, untroubled by any urinary symptom.

CASE 633.

N., a Portuguese general, aged 80, consulted me June 14th, 1909, on the advice of Dr. Kalker, Neuheim, Germany. Prostatic symptoms for nine years. Underwent Bottini's operation in Berlin in 1902, but without any amelioration of his symptoms. Catheter employed for nine years; entirely dependent thereon for three years. Has had lithotrity performed on more than twenty occasions during the last seven years! Much haemorrhage lately, which has rendered him very anaemic and weak. Much difficulty with the catheter at times, as the urethra is

much contracted. Prostate greatly enlarged per rectum, bilobed, soft, movable; easily felt bimanually, but examination painful, probably due to the presence of a stone in the bladder. Urine contains much pus, alkaline; specific gravity, 1010. On June 17th I enucleated the prostate after removing a small phosphatic stone from the bladder, Dr. Kochman being present. It presented a large tongue-shaped projection in the bladder, was very soft, easily enucleated, and weighed 5¼ oz. Time occupied by the operation, including removal of the stone, six minutes. The patient bore the operation well, but an hour afterwards became collapsed, with feeble pulse and cold perspiration. This condition passed off in a couple of hours, and afterwards he had no unfavourable symptom. Some urine passed naturally on July 3rd, and on the 5th the wound was dry. On July 17th he drove to the Zoological Gardens and walked about the grounds.

He is now in excellent health, having put on flesh rapidly, and can pass and retain urine, which is normal, as well as he ever did.

On July 27th his son-in-law wrote: "He is very pleased with the results of the operation. He feels himself quite another man. He holds and passes his water quite well and freely. After so many years of suffering, his actual condition is really marvellous."

REMARKS.

One of the remarkable features of this operation is the success that has attended its employment in advanced old age. In my entire series of 644 operations of enucleation of the prostate to date there have been 48 octogenarians ranging from 80 to 89 years, and 9 bordering on this period, aged 79, with 6 deaths. Indeed, I may say that age has comparatively little influence on the results of the operation, provided the vital organs, and particularly the kidneys, are unaffected or fairly sound. Still, patients of this advanced age are a source of much anxiety, and operation should not be undertaken in such cases without the most careful nursing being available, as well as the constant supervision of the surgeon. The most anxious period is during the first few hours after operation, for, though when placed in bed the patient's pulse may be strong and regular and everything seem progressing satisfactorily, in an hour or two collapse may set in, when restoratives of all kinds must be had recourse to—namely, normal salines, brandy and strong coffee per rectum, warm clothing, hot-water bottles, and strychnine hypodermically. Once this period is passed and reaction sets in, as a rule the patient progresses uninterruptedly towards recovery.

Prostates weighing from 2 to about 5 oz. are those most easily enucleated. In proportion as they are smaller than 2 oz. in weight, they become more difficult to enucleate. Amongst this series of 212 operations there were 13 prostates weighing from 5 to 17 oz. The line of cleavage between the capsule and sheath in prostates of these sizes is almost invariably well defined, but in the extremely large ones it is difficult to reach with the enucleating finger the distal portions—those in proximity to the rectum and triangular ligament—so that the enucleation frequently requires very great exertion on the part of the surgeon, particularly if the patient be stout. Owing to their size, they are also frequently impacted tightly beneath the pubic arch, so that there is some difficulty in sweeping the enucleating finger round them in this direction. The removal of prostates of these sizes is no light or easy task, but with patience and the employment of much physical force they can invariably be enucleated entire.

It would appear at first sight that for the delivery of one of these enormous prostates the incision in the abdominal wall must be very extensive; but in reality this is not so, for the simple reason that in enucleation they almost invariably open out along the anterior commissure, and can be delivered like an open bivalve. One lateral lobe is gripped by the forceps and slowly delivered through the wound; this is followed by the median portion, and lastly by the other lateral lobe. It must also be remembered that the adenomatous prostate is spongy and very compressible between the blades of the forceps. So that, when delivered in the manner indicated, the wound in the bladder need not be more than about one-third the size through which the prostate, closed as you see them suspended in these jars, could be delivered.

One would naturally expect that the haemorrhage attending removal of these large prostates would be severe, but this is not the case. Indeed, the haemorrhage is often trifling, and scarcely ever more than in enucleation of prostates of much smaller sizes.

The average age of all my cases is 69 years, the prostates ranging from ½ oz. to 17 oz., with an average of 2½ oz. In connexion with these 644 operations there have been 39 deaths, in periods varying from six hours to thirty-seven days after operation, or a mortality of 6.05 per cent. The mortality has been gradually diminishing from 10 per cent. in the first 100 cases to 4.24 per cent. in the last 200. The causes of death were: Uraemic symptoms due to chronic kidney disease, 16; heart failure, 6; septicaemia, 2; shock, 4; exhaustion (kidneys much diseased), 1; mania (hereditary in 1), 2; malignant disease of the liver, 2; heat stroke, 1; pneumonia, 1; acute bronchitis, 2; pulmonary embolism, 1; and cerebral haemorrhage with paralysis, 1. Though all these deaths are accepted in connexion with the operation, in not more than half the number can the fatal result be attributed thereto, the remaining deaths being due to disease incident to old age and unconnected directly with the operation. In 114 cases vesical calculi were removed at the same time; but all the deaths in these cases are accepted in connexion with the prostatectomy, none being put down to the suprapubic lithotomy involved.

DISCUSSION.

In reply to observations from the PRESIDENT and others, Mr. FREYER stated that in two or three of his earlier cases he noticed that there was some difficulty in introducing a large catheter, and this he attributed to an hour-glass contraction referred to by Professor Sinclair. To obviate this occurrence and for other reasons, he now, on removal of the large drainage tube on the third or fourth day, placed a small drainage tube in its place, which he kept in till the twelfth or thirteenth day, thus preventing any urine from passing through the urethra. On the removal of this tube a large catheter was passed daily, and the bladder washed out through it, till the surface wound was completely closed. This passage of the catheter daily had the additional effect of moulding the parts and obviating spasm at the neck of the bladder, which was the cause of the feature referred to by Professor Sinclair. Since he had had recourse to this procedure the speaker had not noticed this phenomenon. It was his endeavour to drain the bladder suprapubically occasionally preparatory to prostatectomy—namely, in cases of severe cystitis with symptoms of blood poisoning, and when there was prolonged retention leading to uraemic symptoms. When, in the course of ten or fourteen days, the uraemic symptoms passed off and the bladder became clean, the prostate was enucleated.

DIAGNOSIS OF CANCER BY EXAMINATION OF THE BLOOD.

By E. C. HORT, B.Sc., M.R.C.P.Edin.

THE VALUE OF THE ANTITRYPTIC INDEX IN THE DIAGNOSIS OF MALIGNANT DISEASE.

THE difficulties attending the diagnosis of "cancer" (carcinoma and sarcoma) during life are well illustrated by the following figures:[1]

In three years the total number of cases, at all ages, of disease proved to be malignant, occurring in the practice of thirteen of the leading London hospitals,[2] was 3,532, including cases in which recurrence had taken place. Of this number 582 had not been diagnosed clinically. In addition, 220 cases had been wrongly accused of suffering from malignant disease. Of 303 cases proved by the microscope to have been carcinomatous or sarcomatous, occurring in the first twenty-five years of life, the disease was not diagnosed before inspection in 128, approximately 1 case in 2.3. In addition, 14 cases in the same period of life diagnosed as malignant were proved not to be so.

These figures afford abundant evidence of the pressing need for further refinements in the diagnosis of malignant disease than we at present possess.

To show to what extent this need may be met by measuring the antitryptic power of the serum of patients suspected to be suffering from malignant disease is the primary object of this paper. Incidentally, as will be

seen, the observations here recorded appear to throw some light on the essential auto-infective nature of the disease itself. By the antitryptic power of the serum is, of course, meant the power that a serum has of antagonizing or inhibiting the digestive activity of the ferment trypsin.[3]

Apparently the first to demonstrate variation in the antitryptic activity of serum in disease was von Dungern,[4] who in 1898 showed that the serum of a patient, the subject of suppurative osteo-myelitis, was many times more inhibitory of the proteolytic ferment of the invading coccus than was the serum of a healthy adult. He even suggested that this observation might be of value in determining the identity of an infective agent. The next clinical observations on variation of antiferment activity in disease were those of Ascoli and Bezzola,[5] who demonstrated a rise in the antitryptic content in the serums of several cases of lobar pneumonia before the crisis. In 1907 similar variation in other infections was shown by Wiens,[6] Müller,[7] Kolaczek,[8] and also by Bittorf.[9] Following this came the work of Marcus,[10] and in 1908 Dr. Golla[11] began his observations on variation in the antitryptic content of tuberculous serums, published in 1909. In 1908 I began to study the antitryptic content of cancerous serums, and found, very constantly, marked variation from the normal. The results of examination of some thirty cases of cancer were published by me in June of this year,[12] the results of still further observations being embodied in the present communication. In 1908 work on the same subject was independently undertaken in the Brieger Institute by Brieger and Trebing,[13] of which I had no exact knowledge till June of this year, when I first saw their papers. Their results, unfortunately, as will be seen, cannot be relied on on account of the unsatisfactory nature of the method of measurement employed.

Of the various ways of measuring the inhibition of ferment activity exerted by the antiferments of serum the following, previous to 1909, are the chief:

1. That of Professor Dean,[14] who in 1901 adopted a suggestion by Fermi of gauging the inhibitory power of serum on tryptic digestion of measured columns of gelatin.

2. That of Müller and Jochmann,[15] whose method, introduced in 1906, consisted in adding varying quantities of serum, measured in loops of platinum wire, to drops of pus on a Loeffler plate, and estimating thereby variation in the degrees of pitting caused by the tryptic ferment contained in the polymorphonuclear cells.

3. That of Marcus,[16] and of Brieger and Trebing,[17] who in 1908 adopted the method of Müller and Jochmann, which they modified by substituting commercial trypsin for pus ferment.

4. That of Cross, Bergmann, and Meyer,[18] who in 1908 used the end-point of a tryptic digestion as a guide to the inhibition exerted by serum.

5. That of Herzfeld,[19] who used Fuld's titration method as modified by Bergmann and Meyer.

None of these methods, however, can in practice be relied on to give constant results. All the methods involving the use of a Loeffler plate are particularly unreliable, because (1) as was shown by Hedin,[20] neutralization cannot be thus obtained, and (2) because the degree of pitting can only be very roughly gauged, especially as the bouillon and serum used in preparation of the plates contain, according to the samples taken, varying quantities of albumen. The impossibility of preparing plates with a uniform surface, and of a uniform depth, is also an insuperable objection to their use. They are, it is true, capable of roughly gauging the difference between the inhibitory power of a normal serum and that of a pathological, provided that the difference is sufficiently gross. But for finer degrees of variation, and for showing the differential values of pathological serums from each other, they cannot be recommended.

The only scientific way of measuring antiferment activity, such as the antitryptic, is to estimate the velocity of action of the ferment itself. From this the restraining value of the inhibitory body under investigation can be readily deduced. The first observer to recognize the importance of this in determining the antiferment values of serums was Dr. Golla,[21] who, choosing the physical method of electro conductivity, has already demonstrated its clinical value in measuring the relative antitryptic content of tuberculous serums.

The method I have adopted is a chemical one based on Sörensen's mode of estimating by titration the velocity of tryptic digestion, though further work on the subject may well demonstrate the advantages of even a simpler method. The *modus operandi* of the chemical method has been already published, and for details of manipulation the original papers can be consulted.[22] Briefly the test is this: A measured quantity of normal serum is added to a standard solution of trypsin, the mixture being added, after incubation, to a third standard solution of casein. After incubation at a temperature of 38° C., a fixed quantity of phenolphthalein and formaldehyde is added to a sample of the digest, which is then titrated with soda. The number of cubic centimetres required to neutralize gives the amount of hydrolysis effected. The pathological serums it is desired to examine are treated in exactly the same way, and the differences of inhibitory power recorded, also in terms of hydrolysis.

The first step was to ascertain the constancy of the antitryptic content of serums from subjects that might reasonably be considered healthy. For this purpose the serums of seventeen apparently healthy adults were examined, the results appearing in Table A, where, as will be seen, sixteen out of seventeen, of both sexes, exhibited such slight variation in the antitryptic content of their serums as to justify the establishment of a reliable normal. The seventeenth observation revealed a high antitryptic content, the significance of which was subsequently explained by a history of recent haemoptysis, considered clinically to be tuberculous in origin.

TABLE A.—*Showing the Antitryptic Content of the Serum of Seventeen apparently Healthy Adults, in Sixteen of whom a Normal Antitryptic Content was found.*

A represents the antitryptic content of the serum under examination expressed in terms of the amount of NaOH N/5 required to neutralize 10 c.cm. of a standard solution of trypsin and casein, containing 0.5 c.cm. of serum A, after digestion at 38° C.

B represents the antitryptic content of known healthy human serum expressed in terms of the amount of NaOH N/5 required to neutralize 10 c.cm. of a standard solution of casein and trypsin, containing 0.5 c.cm. of serum B, after digestion at 38° C.

(This explanation of the figures noted applies to all the tables in this paper.)

1	Healthy adult ...	A : B : : 0.60	
2	" ...	A : B : : 0.58	
3	" ...	A : B : : 0.60	: 0.60 (healthy serum I)
4	" ...	A : B : : 0.58	
5	" ...	A : B : : 0.62	
6	" ...	A : B : : 0.61	
7	" ...	A : B : : 0.70	
8	" ...	A : B : : 0.70	
9	" ...	A : B : : 0.70	
10	" ...	A : B : : 0.70	: 0.70 (healthy serum II)
11	" ...	A : B : : 0.68	
12	" ...	A : B : : 0.70	
13	" ...	A : B : : 0.70	
14	" ...	A : B : : 0.48	
15	" ...	A : B : : 0.52	: 0.50 (healthy serum III)
16	" ...	A : B : : 0.60	
17	Tuberculous subject, apparently healthy ...	A : B : : 0.40	: 0.60 (healthy serum IV)

The second step was to ascertain in what class of case of non-infective disease the antitryptic content of the serum is normal. In Table B, therefore, are placed all those cases examined in which a general infection, bacterial (heterogeneous) or cellular (autogenous), was apparently absent. The results appear to show that for all practical purposes the serums of individuals afflicted with many diverse conditions (non-infective in the widest sense of the word) can be regarded as normal, and for purposes of comparison used as such. This list of morbid conditions, not associated with variation in the antitryptic content, is of course only a preliminary one and is open to extension.

TABLE B.—*Certain Morbid Conditions, showing a Normal Antitryptic Content, in which General Infection (Auto- and Hetero-) could be excluded.*

1	Cut throat	Normal
2	Fractured fibula	"
3	Fractured ribs	"
4	Haemorrhoids	"
5	Haemorrhoids	"
6	Varicose eczema	"
7	Colic	"
8	Polycythaemia	"
9	Stricture of urethra	"
10	Convalescent after appendectomy	"
11	General psoriasis	"
12	Chronic mastitis	"
13	Chronic mastitis	"
14	Chronic gastric ulcer	"

15	Chronic gastric ulcer	Normal
16	Chronic duodenal ulcer	,,
17	Simple hypertrophy prostate	,,
18	Non-specific venereal sore, healed two years (Wassermann −)	,,
19	Doubtful specific disease fifteen years before (Wassermann −)	,,
20	Gall stone	,,
21	Carbuncle	,,
22	Carbuncle	,,
23	Hydrocele of cord	,,
24	Furunculosis	,,
25	Acne	,,
26	Varicose ulcer	,,
27	Floating kidney	,,
28	Bronchial catarrh	,,
29	Bronchial catarrh	,,
30	Chronic gastric ulcer	,,
31	Chronic gastric ulcer	,,
32	Chronic gastric ulcer	,,
33	Chronic gastric ulcer	,,
34	Acute gastric ulcer	,,
35	Chronic duodenal ulcer	,,
36	Varicose veins	,,
37	Thoracic aneurysm	,,
38	Oesophageal stenosis	,,
39	Gall stones	,,
40	Haematemesis (? cause)	,,

The third step was to determine in what class of disorders, apart from malignant disease and apart from obvious general infections, serums that might reasonably be expected to exhibit a normal antitryptic content do actually exhibit an abnormal content. All the serums examined which showed abnormal antitryptic contents, except those from cancers and obvious infections, are included in Table C. This list, again, is of course only a preliminary one:

TABLE C.

1	Varicocele	A : B : : 0.40 : 0.65
2	Varicose veins (leg)	A : B : : 0.35 : 0.50
3	Multiple uterine fibroids	A : B : : 0.25 : 0.60
4	Appendectomy after seven days	A : B : : 0.35 : 0.55
5	Hernia, seven days after operation	A : B : : 0.45 : 0.65
6	Hernia	A : B : : 0.49 : 0.60
7	Hernia	A : B : : 0.40 : 0.50
8	Hernia, four days after operation	A : B : : 0.40 : 0.50
9	Fractured femur	A : B : : 0.30 : 0.60
10	Fractured patella	A : B : : 0.45 : 0.60
11	Fractured ribs	A : B : : 0.49 : 0.60
12-14	Nephritis	All raised.

The chief interest of this table lies in the fact that it appears that the cellular disturbance produced by fractures, by hernias, by attacks of nephritis, and no doubt by many other conditions, is just as potent a factor in producing profound blood changes as are severe bacterial infections. The significance of such phenomenon will be referred to later.

The final step, prior to systematic examination of cancerous serums, was to determine to what extent the antitryptic content of the serum undergoes variation in infective disorders as a class, For this purpose 52 cases were examined, the diseases selected being scarlatina, measles, typhoid, acute septicaemia, syphilis, leprosy, and tuberculosis. As will be seen by reference to Table D, the antitryptic content was found to be raised in all the cases in which the respective infection was still in force, except in two cases of the anaesthetic form of leprosy, one tertiary syphilide, and one case of scarlet fever, in which there appeared to have been an experimental error.

TABLE D.—*Showing Antitryptic Content of Serum in Certain Infective Diseases.*

1	Measles during fever (figures lost)	Antitryptic content raised.
2	,, ,, ,, ,,	,, ,, ,,
3	,, ,, ,, ,,	,, ,, ,,
4	Measles, convalescent	,, ,, normal.
5	Syphilis (I) (figures lost)	,, ,, raised.
6	,, (II) ,,	,, ,, ,,
7	,, (I)	,, ,, ,,
8	,, (III)	,, ,, subnormal
9	Leprosy, nodular form	A : B : : 0.40 : 0.60
10	Acute septicaemia, ruptured ovarian cyst	A : B : : 0.40 : 0.65
11	Typhoid, second week	A : B : : 0.48 : 0.60
12	Typhoid, time not stated	A : B : : 0.50 : 0.60
13	Scarlatina, temperature 104° F.	A : B : : 0.45 : 0.65
14	,, ,, 103° F.	A : B : : 0.40 : 0.65
15	,, ,, 101° F., tenth day	A : B : : 0.66 : 0.65 (?experim. error)
16	Scarlatina, temperature normal for two days	A : B : : 0.43 : 0.65
17	Scarlatina, temperature normal for six days	A : B : : 0.37 : 0.65
18	Scarlatina, twenty-second day, complicated by measles second day	A : B : : 0.43 : 0.65
19	Scarlatina, temperature normal for six days	A : B : : 0.37 : 0.65
20	Scarlatina, temperature normal for eleven days	A : B : : 0.45 : 0.65
21	Scarlatina, temperature normal for thirty days	A : B : : 0.64 : 0.65
22	Scarlatina, temperature normal for thirty days	A : B : : 0.64 : 0.65
23	Scarlatina, temperature normal for thirty days	A : B : : 0.75 : 0.65
24 to 43	Nineteen cases of pulmonary tuberculosis, disease active	Antitryptic content raised in all
44	Renal tuberculosis, active	Antitryptic content raised
45	Suppurating glands, neck	Antitryptic content raised
46 47	Peritoneal tuberculosis	Antitryptic content raised
48	Interstitial keratitis	Antitryptic content normal
49 50	Healed or arrested pulmonary tuberculosis	Antitryptic content raised
51	Leprosy, nodular form, last stages	A : B : : 0.25 : 0.60
52	,, anaesthetic form	A : B : : 0.58 : 0.60
53	,, ,, ,,	A : B : : 0.58 : 0.60

Table D is of peculiar interest because it shows that in bacterial infections, and in other infections in which the "*materies morbi*" is unknown, the serum has a high antitryptic content during the course of infection; that the content remains high during convalescence, but that it becomes normal when convalescence is fully established. The significance of these observations, at present necessarily incomplete, in their bearing on a similar phenomenon occurring in malignant disease will also be referred to later.

The next step was the examination of the serums of patients proved either by clinical history or by microscopical section, or by both, to be subjects of malignant disease. In Table E are given the results of examination of all the cases of carcinoma in which a high antitryptic content was found.

TABLE E.—*Ninety-four Cases of Carcinoma, in all of which a Raised Antitryptic Content was found.*

1	Carcinoma of breast	A : B : : 0.90 : 1.00
2	,, ,,	A : B : : 0.68 : 0.96
3	,, ,,	A : B : : 0.49 : 0.70
4	,, ,,	A : B : : 0.51 : 0.65
5	,, ,,	A : B : : 0.40 : 0.60
6	,, ,,	A : B : : 0.62 : 0.65
7	,, ,,	A : B : : 0.65 : 0.90
8	,, ,,	A : B : : 0.35 : 0.70
9	,, ,,	A : B : : 0.72 : 0.90
10	,, ,,	A : B : : 0.50 : 0.60
11	,, ,,	A : B : : 0.45 : 0.65
12	,, ,,	A : B : : 0.45 : 0.60
13	,, ,,	A : B : : 0.55 : 0.65
14	,, ,,	A : B : : 0.43 : 0.56
15	,, ,,	A : B : : 0.30 : 0.60
16	,, ,,	A : B : : 0.45 : 0.60
17	,, ,,	A : B : : 0.30 : 0.65
18	,, ,,	A : B : : 0.45 : 0.65
19	,, ,,	A : B : : 0.58 : 0.65
20	Carcinoma of cervix	A : B : : 0.41 : 0.56
21	,, ,,	A : B : : 0.45 : 0.75
22	,, ,,	A : B : : 0.40 : 0.70
23	,, ,,	A : B : : 0.35 : 0.75
24	,, ,,	A : B : : 0.38 : 0.65
25	,, ,,	A : B : : 0.35 : 0.65
26	,, ,,	A : B : : 0.85 : 0.95
27	,, ,,	A : B : : 0.41 : 0.56
28	,, ,,	A : B : : 0.90 : 1.00
29	,, ,,	A : B : : 0.75 : 0.80
30	Carcinoma of body	A : B : : 0.45 : 0.75
31	,, ,,	A : B : : 0.45 : 0.75
32	,, ,,	A : B : : 0.35 : 0.65
33	Carcinoma of rectum	A : B : : 0.45 : 0.65
34	,, ,,	A : B : : 0.35 : 0.65
35	,, ,,	A : B : : 0.45 : 0.65
36	,, ,,	A : B : : 0.77 : 0.96
37	,, ,,	A : B : : 0.50 : 0.60
38	,, ,,	A : B : : 0.50 : 0.60
39	,, ,,	A : B : : 0.40 : 0.60
40	Carcinoma of oesophagus	A : B : : 0.40 : 0.60
41	,, ,,	A : B : : 0.70 : 0.96
42	,, ,,	A : B : : 0.40 : 0.65
43	,, ,,	A : B : : 0.50 : 0.60
44	Carcinoma of tongue	A : B : : 0.45 : 0.75
45	,, ,,	A : B : : 0.70 : 0.96
46	,, ,,	A : B : : 0.90 : 1.05
47	,, ,,	A : B : : 0.50 : 0.60
48	Carcinoma of sigmoid	A : B : : 0.60 : 0.78
49	,, ,,	A : B : : 0.76 : 0.96
50	,, ,,	A : B : : 0.45 : 0.60
51	Carcinoma of pylorus	A : B : : 0.80 : 0.96
52	,, ,,	A : B : : 0.60 : 0.90
53	,, ,,	A : B : : 0.68 : 0.80
54	,, ,,	A : B : : 0.50 : 0.70
55	,, ,,	A : B : : 0.60 : 0.80
56	,, ,,	A : B : : 0.50 : 0.80
57	Carcinoma of colon	A : B : : 0.56 : 0.70
58	,, ,,	A : B : : 0.45 : 0.64
59	,, ,,	A : B : : 0.46 : 0.60
60	Carcinoma of larynx	A : B : : 0.68 : 0.96
61	,, ,,	A : B : : 0.45 : 0.65
62	,, ,,	A : B : : 0.35 : 0.70
63	,, ,,	A : B : : 0.35 : 0.70
64	Carcinoma of mouth	A : B : : 0.35 : 0.70
65	,, ,,	A : B : : 0.85 : 1.00
66	,, ,,	A : B : : 0.45 : 0.65
67	,, ,,	A : B : : 0.45 : 0.60
68	Carcinoma of cervical glands (II)	A : B : : 0.62 : 0.82
69	,, ,,	A : B : : 0.40 : 0.50
70	,, ,,	A : B : : 0.24 : 0.60
71	Carcinoma of palate	A : B : : 0.52 : 0.60
72	,, ,,	A : B : : 0.40 : 0.60

73	Carcinoma of tonsil	A : B : : 0.20 : 0.70
74	,, ,, ...	A : B : : 0.45 : 0.75
75	Carcinoma of lip	A : B : : 0.45 : 0.75
76	,, ,, ...	A : B : : 0.50 : 0.65
77	Carcinoma of prostate	A : B : : 0.40 : 0.65
78	,, ,, ...	A : B : : 0.53 : 0.68
79	Carcinoma of caecum	A : B : : 0.95 : 1.05
80	,, ,, ...	A : B : : 0.45 : 0.75
81	Carcinoma of uterus (omitted)	A : B : : 0.35 : 0.85
82	Carcinoma of nose	A : B : : 0.30 : 0.60
83	Carcinoma of antrum	A : B : : 0.25 : 0.60
84	Carcinoma of scrotum	A : B : : 0.40 : 0.60
85	Carcinoma of anus	A : B : : 0.34 : 0.68
86	Carcinoma of mesentery	A : B : : 0.84 : 0.96
87	Carcinoma of throat	A : B : : 0.40 : 0.60
88	Carcinoma of lip	A : B : : 0.50 : 0.60
89	Carcinoma of rectum	A : B : : 0.30 : 0.60
90	Carcinoma of breast	A : B : : 0.40 : 0.60
91	Carcinoma of uterus	A : B : : 0.35 : 0.60
92	Carcinoma of breast	A : B : : 0.30 : 0.65
93	Carcinoma of rectum	A : B : : 0.40 : 0.70
94	Carcinoma of anus	A : B : : 0.45 : 0.70

I desire to draw particular attention to the fact that the rise in antitryptic content observed in these cases bore no relation whatever to the presence or absence of cachexia. In at least 30 per cent. of the cases no cachexia, in the accepted use of the word, could be demonstrated.

In Table F are given all the cases of carcinoma examined in which estimation of the antitryptic content before operation failed to show any rise. In these cases, therefore, the test was of no value whatever as a diagnostic aid.

TABLE F.

No.	Situation of Growth.	Antitryptic Content.	Proof of Malignancy.
95	Carcinoma mammae	Normal	By sections.
96	,, tongue	,,	,,
97	,, ,,	,,	,,
98	,, uterus	,,	Clinical only.
99	,, antrum	,,	,,
100	,, oesophagus	,,	,,

In the first case, that of a mammary cancer in a lady aged 83, it is possible that the normal antitryptic content found is an indication of the extreme chronicity occasionally associated with carcinoma mammae in elderly subjects, or, in other words, of effective spontaneous immunization. In the remaining cases no such explanation appears possible.

Granting proved malignancy in all six cases in Table F, the antitryptic content of the serum failed to give any indication of the nature of the disease in 6 cases out of 100, literally 6 per cent. On the other hand, Table E shows that out of a total of 100 consecutive cases of indisputable malignant disease a high antitryptic content was found in 94 cases, literally in 94 per cent.

The object of the next table is to show that the antitryptic content of a cancerous serum becomes normal, and remains normal, in cases submitted to operation in which the operation has been, up to the time of blood examination, effective—effective, that is, in the sense of complete ablation of the tumour requiring operation, and thereby of preventing recurrence. In each of the cases recorded in Table G the patients were in perfect health at the time of the examination of the blood, and did not show any clinical signs of recurrence. It is to be noted that there is in these cases no evidence that the antitryptic content was high before operation, as operation took place before the test had been elaborated. Since, however, a high antitryptic content was found in 94 of 100 cases examined in which the presence of carcinoma was indisputable, and since a high content was found in all the cases in Table H, where recurrence was proved, it is a fair assumption that the content was high before operation. In all the cases in Tables G and H positive evidence is available that the tumours removed were carcinomatous.

TABLE G.

No.	Situation of Growth.	Operation.		
1	Carcinoma breast	Radical, 1905	A : B : : 0.75 : 0.75	in June, 1909.
2	,, rectum	,, 1907	A : B : : 0.75 : 0.75	,,
3	,, breast	,, 1909	A : B : : 0.75 : 0.75	,,
4	,, ,,	,, 1904	A : B : : 0.75 : 0.80	,,
5	,, ,,	,, 1905	A : B : : 0.74 : 0.80	,,

In Table H, as will appear, the reverse picture is seen—that is, in all the cases examined in which recurrence had already taken place, the antitryptic content was high.

TABLE H.

No.	Situation of Growth.	Operation.	Recurrence.	
1	Carcinoma breast	Radical, 1907	May, 1909	A : B : : 0.40 : 0.65
2	Carcinoma penis	Amputation, 1908	June, 1909	A : B : : 0.45 : 0.75
3	Carcinoma tongue	Radical, 1907	In cervical glands, June, 1909	A : B : : 0.62 : 0.82
4	,,	,, 1908	In cervical glands, 1909	A : B : : 0.40 : 0.50
5	Carcinoma breast	,, 1905	In scar, 1909	A : B : : 0.50 : 0.60
6	Carcinoma jaw	,, 1902	In cervical glands, 1907	A : B : : 0.24 : 0.60
7	Carcinoma breast	,, 1901	June, 1909	A : B : : 0.30 : 0.65
8	,,	,, 1908	,,	A : B : : 0.45 : 0.65

Cases 7 and 8 in this table are of interest because the recurrence in both cases had been treated with considerable success, judged by the diminution in the size of the recurrent swelling, under *x* rays. In spite of the apparent clinical improvement, the blood examination tends to show that the recurrent focus of disease was at the time of the blood examination active. If these results are compared with the figures obtained from examination of the cases operated on in which, up to the time of examination, no recurrence had taken place, it appears that surgery is still to be preferred to treatment by *x* rays.

The diagnostic value of determination of the antitryptic content of the serum in cases where any suspicion has arisen of the presence of carcinoma may be best appreciated by reference to a few illustrative cases.

CASE I.—In this case the clinical symptoms pointed to simple hypertrophy of the prostate on account of mechanical obstruction to evacuation of the bladder. There was no haemorrhage, or pain, or cachexia. Examination, however, of the blood revealed a high antitryptic content, the figures being A : B : : 0.40 : 0.65. The prostate was enucleated, and the correctness of the diagnosis of malignancy based on the blood examination confirmed by sections of the organ which revealed the carcinomatous nature of the growth. In this case, then, all the weight of clinical evidence was against malignancy, but the blood examination afforded a truer guide.

[Owing to exigencies of space the rest of the cases are omitted.—ED.]

CONCLUSIONS.

The finding of a normal antitryptic content in any case where the question of malignancy has arisen appears to be of the greatest value in excluding a diagnosis of cancer. Unfortunately, the positive value of a negative diagnosis is not absolute, since the test was of no value in 6 cases out of 100.

The finding of a raised antitryptic content in any case where the question of malignancy has arisen does not justify a positive diagnosis of the presence of cancer, since I have found constantly a raised content in measles, scarlatina, enteric, tuberculosis, acute septicaemia, some cases of leprosy and syphilis, and a similar rise will also almost certainly be found in many other infections, as well as in certain auto-infections, such as nephritis. In spite of this, however, a raised antitryptic content appears to be often of great value in deciding a doubtful opinion as to the presence of malignant disease, since the greatest incidence of cancer is at the period when the infective incidence (hetero-infection) is at its lowest.

In the absence of obvious infection, the possibility that a raised antitryptic content may sometimes be due to auto-infection from non-malignant cell aberration must constantly be borne in mind.

A raised antitryptic content appears to be often of the greatest value in distinguishing between an innocent neoplasm and a malignant. Its chief value appears to lie in distinguishing, for example:

1. Chronic mastitis and benign neoplasms from cancer of the breast.
2. Simple hypertrophy of the prostate from cancer of the prostate.
3. Simple gastric ulcer from carcinoma of the stomach, and the complication of the former by the appearance of the latter.

4. Carcinoma of cervix and uterus from simple inflammatory conditions of those organs.

Quite apart from the diagnostic value of measurements of the antitryptic content of serums suspected to be cancerous, the observations here recorded throw, I submit, a strong light on the relation of auto-infection to hetero-infection, and, more important still, on the essential nature of cancerous disease itself.

The popular conception of infection as a process that is purely dependent on the presence of micro-organisms is, as I have elsewhere postulated,[23] a conception that bars the way to progress in the modern interpretation even of disease admittedly bacterial, and arrests all our efforts at its cure. If we find, as these observations show that we do find, variation in the antiferment activities of serums from cases of disease where the bacterial element is incapable of demonstration, as in simple fracture, or in non-suppurative nephritis, or in hernia, or in non-ulcerated carcinoma, side by side with a similar variation in cases of disease that are patently bacterial, we surely hold a strong position. For here we have weighty presumptive evidence not only that auto-infection from cells and their derivatives occurs in the absence of bacterial invasion, but is also a factor that cannot be neglected in diseases in which we know bacteria to exist. The bearing of such argument on modern methods of treatment of bacterial infections that vainly hope to achieve success by bacterial vaccines only I have already dwelt on.[24]

As regards the direct significance, *quâ* malignant disease, of the enormous variation that I have shown to occur in the antitryptic content of cancerous serums, it is premature to hazard explanations. But the mere fact that such change in antiferment activity should be intimately and constantly associated with the "metabolic vice" that we call cancer at the least is an indication that we must look to intracellular derivatives, such as enzymes, co-enzymes, and the products of morbid cell activity, to provide us with a key to effective immunization against malignant autoinfection. Not the least significant of the facts here noted, in its bearing on the cellular factor in the complex immunization machine, is the return to normal of an antitryptic content after removal of the malignant focus and its maintained high level when recurrence or extension occurs.

I wish to record my indebtedness to Mr. Pearce Gould and to Dr. Lazarus-Barlow in the Cancer Department of the Middlesex Hospital; to Mr. Leaf at the Cancer Hospital; to Sir Malcolm Morris; to Dr. Phineas Abraham; to Mr. Mansell Moullin and Dr. Sequeira, at the London Hospital; to Mr. Lenthal Cheatle, at the Italian Hospital; to Dr. Keats, at the Camberwell Infirmary; and to Dr. Gompertz, at King's College Hospital, for the generous manner in which they have placed at my disposal much of the material necessary for this investigation, and to Drs. Bayly and Venning for their great help in the collection and separation of serums. The expense involved has been defrayed by the Private Research Fund which I have the honour of directing.

REFERENCES.

[1] Bashford and Murray, *Imperial Cancer Research*, 1905, No. 2. [2] Guy's, London, Middlesex, St. Bartholomew's, St. George's, St. Mary's, Charing Cross, Great Northern Central, Ormond Street, etc. [3] Hort, *Rational Immunization. the Antitryptic Index*, March, 1909, pp. 67 et seq. [4] Von Dungern, *Münch. med. Woch.*, 1898, xlv, p. 1040. [5] Ascoli and Bezzola, *Berl. klin. Woch.*, 1903, No. 17. [6] Wiens, *Berl. klin. Woch.*, 1908, No. 14. [7] Müller and Wiens, *Centralbl. f. inn. Med.*, 1907, No. 38. [8] Kolaczek, *Deutsch. med. Woch.*, 1907, No. 7. [9] Bittorf, *Deutsch. Arch. klin. Med.*, xci, p. 20. [10] Marcus, *Berl. klin. Woch.*, 1908, No. 14. [11] Golla, *Lancet*, March, 1909. [12] Hort, *Clin. Journ.*, June 9th, 1909, pp. 141 et seq. [13] Brieger and Trebing, *Berl. klin. Woch.*, 1908, var. [14] Dean, George, *Trans. Path. Soc. Lond.*, 1901, lii, pp. 130 et seq. [15] Müller and Jochmann, *Münch. med. Woch.*, 1905, No. 29. [16] Marcus, *Berl. klin. Woch.*, 1908, No. 14. [17] Brieger and Trebing, *Berl. klin. Woch.*, 1908, var. [18] Bergmann and Meyer, *Berl. klin. Woch.*, 1908, xxii, p. 37. [19] Herzfeld, Ernst, "Beit zur Brieger," *Berl. klin. Woch.*, 1908, xlv, p. 2182. [20] Hedin, *Bioch. Journ*, vi, p. 10; idem, *Journ. Physiol*, 1905. [21] Golla, *Lancet*, March, 1909. [22] Sörensen, *Etudes enzymatiques, Lab. de Carlsberg*, 1907, vii, p. 1; Bayliss, *The Nature of Enzyme Action*, 1908, p. 24; Smith, *Bioch. Journ.*, 1909; Hort, *Clin. Journ.*, June 9th, 1909, p. 142. [23] Hort, *Proc. Royal Soc. Med.*, June, 1909. [24] Hort, *Practitioner*, June, 1909.

SOME CASES OF INTESTINAL ANASTOMOSIS.

By G. H. EDINGTON, M.D., C.M., F.F.P.S.,

Professor of Surgery, Anderson's College Medical School; Assistant Surgeon, Western Infirmary; and Extra Honorary Surgeon, Royal Hospital for Sick Children, Glasgow.

INTESTINAL anastomosis has for a long time excited interest. The frequent necessity for its performance has stimulated the ingenuity of the surgeon in the direction of simplification and improvement in technique, and its feasibility, coupled with the benefits which in many cases it confers on the patient, have so completely justified the procedure that it may now be looked upon as firmly established. The following cases are examples of some of the conditions in which anastomosis is required, and they enable us to estimate its usefulness, whether as a curative or palliative measure.

The cases fall into three classes, according to the part of the bowel concerned in the operation. In the first of these the anastomosis concerns the small intestine alone —*entero-enterostomy* (Cases I–IV); the second comprises cases where the anastomosis is made between the ileum and the colon—*ileo-colostomy* (Cases V–IX); in the third class, represented by a single case (Case X), the communication involves the large intestine alone—*colo-sigmoidostomy*. For permission to record such of these cases as occurred in hospital practice I have to thank Sir Hector Cameron, in whose wards in the Western Infirmary I had the opportunity of treating them.

CLASS I.—*Entero-enterostomy.*

In this class there are 2 cases of gangrenous strangulated hernia and 1 case of gunshot wound of the mesentery, in all of which enterectomy was performed. In a fourth case an almost complete transverse rupture called for occlusion of the bowel without enterectomy.

CASE I.—*Strangulated Umbilical Hernia, Gangrenous: Resection of Gut and Omentum: Entero-anastomosis: Gangrene at Seat of Anastomosis: Faecal Fistula: Cure.*

J. H., aged 58, inspector, a patient of Dr. Horne, was admitted to Western Infirmary, Ward 30, on December 29th, 1908, with strangulated umbilical hernia. The hernia, which had existed for many years, became strangulated fourteen hours before admission.

State on Admission.—The patient, who was very obese, looked ill, but made no complaint of great pain. The umbilical swelling was *extremely hard*, tense, and tender, was covered with reddened skin, and projected very little. The percussion note was tympanitic in parts; there was no palpable impulse on coughing.

Operation.—Median incision. Sac contained greenish omentum and a loop of small intestine, black, and with here and there yellowish streaks. The umbilical ring was notched above, and the bowel drawn down. Lateral anastomosis was performed, and the loop was cut away, the mesentery being tied in sections. The hypertrophied omentum in the sac was ligated in sections and cut away. The abdominal wound was partially closed with through-and-through sutures, and at its upper end gauze packing inserted into the peritoneal cavity.

Progress.—He was fairly comfortable till the third day, when he became very restless and even delirious at night. Two days later he passed *per anum* a quantity of blood, and the following day he had haematemesis. General condition remained unsatisfactory till January 7th, when there was a profuse bloody faecal discharge from opening at upper end of the wound. Condition at once improved.

Result.—He left the hospital on February 22nd. The fistula had almost closed, and the bowels were acting well. I saw him again on March 12th, when the fistula was completely healed, and I have since heard from his doctor that he keeps well and is able to attend to business.

This case is interesting from the diagnostic point of view. The great hardness, the inflammatory condition of the skin, and the absence of marked protrusion were suggestive of acute cellulitis; and it was chiefly Dr. Horne's corroboration of the history that helped me to a correct diagnosis. I believe, further, that the patient owed his life to the fact that the wound had not been completely closed. This permitted the escape externally of bowel contents, after gangrene at the seat of anastomosis had occurred; and in this respect this case may be contrasted with the one which immediately follows.

CASE II.—*Strangulated Femoral Hernia, Gangrene at Seat of Constriction: Resection through Laparotomy Wound: Entero-anastomosis: Gangrene at Seat of Anastomosis, with Leaking and Commencing Peritonitis: Death.*

Mrs. J. McT., aged 57, sent by Dr. McQueen, Cumnock, admitted to Western Infirmary, Ward 29, on June 9th, 1909, with strangulated femoral hernia of two and a half days' duration. The hernia had been noticed for four years. After admission she vomited a quantity of yellowish fluid matter, having a faecal odour. The abdomen was flaccid, and the pulse 92 per minute. There was a strangulated femoral hernia, of the size of a large hen's egg, on the left side.

Operation.—On opening the sac, a quantity of omentum, greyish in colour and adherent to sac, was exposed. On raising this, a knuckle of small intestine was seen. The gut was light purple in colour, was tightly constricted at the femoral ring, and during manipulations it gave way. The abdomen was opened

above Poupart's ligament, the ring notched from within, and bowel pulled up. Gangrene at seat of constriction; excision of loop and lateral anastomosis performed; omentum cut away, sac invaginated and abdominal wound closed in layers.

Progress.—She kept well till noon on June 11th, when she vomited a mouthful of fluid faecal matter. This being repeated, the abdomen was reopened on the 12th. The bowel at seat of anastomosis was found to be gangrenous. The wall of distal piece had sloughed in the neighbourhood of the closed end, and the anterior part of the anastomosis wound had gaped widely. Tubes were tied into both pieces of gut. A quantity of faecal fluid, similar to what had been washed out of the stomach, came away through the tube in the proximal piece of gut; and both pieces were syringed with saline.

Result.—These measures gave temporary relief, but she began to have difficulty in swallowing. She became progressively weaker, and died at 6 a.m. on June 14th, four days and six hours after the first operation.

When this case is contrasted with the preceding one, it must be admitted that it would have been safer to leave the wound partly open. If this had been done, the peritonitis, fairly widespread, which was demonstrated *post mortem*, might have been avoided.

The occurrence of gangrene in both cases is interesting in view of the fact that in both the affected loop had been freely excised, and that the anastomosis was made in apparently healthy bowel. There must be a limit to the amount of bowel which should be removed in these cases. The difficulty in fixing this limit is shown in both of the above cases, when we consider the apparent healthiness of the parts. That the gangrene was not connected with *operative* interference with the mesentery in the performance of the enterectomy is shown by the next case.

Perhaps the best plan to follow in cases such as the above would be to leave the abdominal wound partly open with gauze packing, and if things went well to close it secondarily in the course of a week or so.

Case III.—*Gunshot Wound of Abdomen: Implication of Mesentery: Resection of Corresponding Portion of Bowel: Lateral Anastomosis: Recovery.*

T. B., aged 25, baker, was brought to the Western Infirmary on February 24th, 1909, by Dr. McGeogh of Girvan, with gunshot wound of the abdomen. The accident happened at lunch time, and he received the contents of a fowling-piece at a distance of 5 yards in the right thigh and abdomen. Shortly after the accident he vomited, and there was a small quantity of blood in the vomitus.

State on Admission.—When admitted nine hours after the accident, he was suffering from shock, and complained of pain in the wounded area. There were numerous shot holes in the right iliac region, and longitudinal scratches over the region of Scarpa's triangle. The percussion note in the right iliac region and right flank was dull. The liver dullness was (?) somewhat diminished.

Operation.—The abdomen was opened through the sheath of the right rectus, the muscle being hooked inwards. Many pellets were felt in the different layers of the abdominal wall and some in the wall of the gut. On opening the peritoneal cavity a considerable quantity of blood escaped. There was some ecchymosis on the postero-external aspect of the caecum. Working up from the ileo-caecal junction for several feet, a part of the small intestine was reached, which showed at the mesenteric attachment two ecchymotic spots, with irregularity, as if the mesentery had been torn. The bowel higher up was unharmed. A portion of bowel, about 12 in. long, including the two areas mentioned, was excised, the ends closed, and lateral anastomosis made. A drainage tube was passed into the pelvis and the abdominal wound closed by through-and-through sutures.

Result.—He made a good recovery, and left the hospital on April 6th. For some days after operation he had slight jaundice. On March 2nd he had a tarry motion after a glycerine enema, and there was evidence of blood in the stools till March 12th. On March 9th he complained of abdominal pain and vomited, but was quite well on the following day. During convalescence numerous pellets worked their way out through small sloughing openings in the skin. A stereoscopic *x*-ray photograph, taken by Dr. W. F. Somerville after the patient was convalescent, showed a large number of pellets situated deeply in the iliac and femoral regions. I last saw him on May 27th, at which time he continued well.

The history of haematemesis, the condition of shock, and the area of dull percussion extending up from the wounded region of the abdomen, pointed to visceral injury with intra-abdominal extravasation of blood. This was demonstrated when the peritoneum was opened. Active haemorrhage had ceased, and it was difficult to determine the seat of serious injury. It was questionable whether enterectomy was necessary; but the risk of gangrene following the injury of the mesentery determined me to remove the piece of bowel concerned. The subsequent melaena was probably due to extravasation of blood into the bowel as an immediate result of the gunshot injury to its walls.

The following case of entero-anastomosis, I wish merely to mention: it has been elsewhere published in detail:[1]

Case IV.—*Almost Complete Transverse Rupture of Ileum, of Traumatic Origin: Occlusion of Torn Ends: Lateral Anastomosis: Recovery.*

George W., aged 12, was jammed between a lamp-post and a barrow over which he had lost control. His abdomen came into violent contact with the lamp-post. Immediate and repeated vomiting set in, and he had severe generalized pain in the abdomen. Within a few hours the abdominal wall had become board-like, and restlessness had set in.

Operation.—The abdomen was opened about eleven hours after the accident. There was a large quantity of brownish bloody fluid in the recto-vesical pouch; and a transverse rupture of the ileum was found about 80 in. above the ileo-caecal junction. The mesentery at the seat of the rupture was slightly torn, and a considerable area of it was ecchymotic. The rupture was completed, the ends occluded, and lateral anastomosis made. Recovery was uneventful. When I saw him recently he was well, and had no complaints.

One feature which I would refer to, and which this case possessed in common with Case II, was the narrowing of the torn ends of the bowel. In Case II, although a wide opening-up of the anastomosis wound was found at the second operation, there was very little extravasation of intestinal contents into the peritoneal cavity. Not only had peristalsis ceased in the gangrenous portion of the bowel, but from the fact that the proximal limb of gut was distended with fluid faeces which poured out through the rubber tube inserted into the gut, I think there can be little doubt that the faecal current was *mechanically* obstructed by prolapsed mucous membrane, and probably also by some contraction of the circular muscle of the intestine.

In Case IV the orifices of the torn ends of the gut were narrowed by the everted mucous membrane, but the empty state of the proximal limb prevented me from coming to any conclusion as regards the efficiency of any obstruction thereby produced.

Class II.—*Ileo-colostomy.*

This class comprises 5 cases in which, with one exception, an irremovable cancerous tumour involved the caecum and ascending colon. The exception referred to was probably a case of tuberculosis of the caecum. In all the cases there was some degree of obstruction, and in all save one (Case VII) the operation, while not curative, may justly be looked upon as distinctly palliative.

Case V.—*Mass—(?) Tuberculous—in Caecal Region for Eighteen Years, with, of late, Slight Obstruction: Ileo-transverso-colostomy: Faecal Fistula between Caecum and Abdominal Wall: Secondary Occlusion of Ileum partly Successful in Stopping Discharge from Fistula.*

Mr. B., aged 50, was sent to me by Dr. Watt, of Ayr, on June 5th, 1908. A fairly healthy-looking man, he had suffered from digestive troubles for thirty years. Since 1890 he had noticed a "lump" in the right iliac region, and there was a complaint of occasional attacks of pain in this region, with sometimes an interval of several months between the attacks. Constipation was habitual. About six weeks before I saw him violent physical exertion had been followed by pain in the "lump." He was put on liquid diet three or four weeks later, and this alleviated the pain. At the same time constipation gave way to diarrhoea. He described also as a symptom "flatulence," which seemed to settle in the iliac swelling and to "pass through" with gurgling.

State on Examination.—There was in the upper part of the right iliac region an easily palpable, firm, and not very movable swelling of the size and shape of a large duck-egg and with long axis vertical. The known duration of the swelling was in favour of its being non-malignant. Anastomosis was recommended to relieve symptoms of obstruction.

Operation.—On June 17th the abdomen was opened through the right rectus. To the outer side of the incision was a mass adherent to the anterior abdominal wall. The mass involved the ileo-caecal portion of bowel, and extended some way up the ascending colon, and the ileum entered its lower pole. A loop of ileum, a little way up from its termination, was anastomosed to the somewhat shrunken transverse colon, the loop being twisted so that its peristaltic wave would, at the seat of anastomosis, pass from right to left. Six days later a superficial abscess formed external to the laparotomy wound, and proved to be the beginning of a faecal fistula. I saw him again on October 10th. He had been, on the whole, very comfortable, and able to get about. The discharge from the fistula continued,

but occasionally ceased for a day or two, and he experienced some pain, which was relieved when discharge reappeared.

Second Operation.—The abdomen was opened, and the ileum occluded between the anastomosis and the caecum. At the same time I opened externally a fetid abscess close to the iliac spine.

Result.—When I saw him on December 11th the median wound was soundly healed. The original laparotomy wound had puckered considerably; there was still a fistula from which there came occasional faecal discharge, particularly after taking purgative medicines. The abscess cavity near the iliac spine was still discharging, though slightly. The patient was fat, and in good condition.

I have little doubt that in this case we have an example of tuberculosis of the caecum. I feel that an absolute diagnosis could be made only by a microscopic examination of the affected tissues; but the clinical history of the case, the condition of the parts found on opening the abdomen and the subsequent formation of fistulae are all in agreement with the description given by Mr. Maylard in his recent work on abdominal tuberculosis.[2]

The simple ileo-colostomy did not act so well as I expected, and the secondary operation of occlusion of the ileum was followed by distinct improvement so far as quantity of discharge from the fistula was concerned. The persistence of the faecal character of the discharge is explicable as resulting from the reverse current in the colon; but I am in hopes that the deviation of the main faecal current will in time be followed by healing of the lesion in the caecum, and I am encouraged in this hope by the experience of other surgeons.[3]

The remainder of this group of cases were malignant, and palliation was all that could be hoped for from operative interference.

CASE VI.—*Cancer of Caecum involving Ileum and Ascending Colon: Intermittent Obstruction Severe: Ileo transverso-colostomy: Subsequent Rapid Increase of Tumour, and Death in Three Months after Obstruction for one Week.*

Mrs. M. B., aged 45, a patient of Dr. R. M. McLennan of Partick, was admitted to Western Infirmary, Ward 29, on May 9th, 1908, with intestinal obstruction. Four weeks previously she began to suffer pain in the abdomen, coming on gradually, fairly severe, and located around the umbilicus. The pain lasted for five or ten minutes and recurred at intervals, sometimes three or four times in a day. Some days she was quite free from pain. The bowels were kept regular by the use of purgatives. After about one week she took to her bed on account of feeling faint. She had then frequent vomiting of yellowish material and constant pain in the abdomen, with exacerbations at intervals of half an hour to an hour. The vomiting ceased but the pain remained, though neither so severe nor so frequent. For the next few days she remained free of symptoms, but pain and vomiting again troubled her. The pain was paroxysmal and was accompanied by audible rumbling. The day before admission the bowels moved very slightly after a large enema; for six days prior to this there had been no movement.

State on Admission.—There was slight distension of the abdomen, with a tympanitic note. Tender mass felt on palpation in right iliac region. On the day following admission she had neither pain nor vomiting, but the next day the pain was very severe and she vomited five or six times, the vomit consisting of bile-stained fluid. There was great tenderness and rigidity over the abdomen, slight distension, and peristalsis on palpation. Improvement followed by relapses till 14th, when operation was performed.

Operation.—Median laparotomy. The caecum was found fixed down by adhesions, and a loop of ileum was adherent to it. There was marked enlargement of the colic glands. The transverse colon was brought down out of the wound, and at its middle anastomosis was made with loop of ileum.

Result.—Vomiting persisted for four days after operation. After vomiting ceased she had free evacuation of the bowel. She left the hospital on June 16th, taking light diet and having regular action of the bowels without requiring medicine.

In a subsequent communication from her doctor I learned that she died on August 11th. The tumour took on rapid growth a week or two after she left the hospital, and within four or five weeks filled up nearly the whole of the right side of the abdomen and extended across the middle line. There was rapid emaciation, and intestinal obstruction existed for one week before death.

CASE VII.—*Cancer of Caecum and Ascending Colon, with Secondary Growth in Peritoneum and Omentum: Intermittent Obstruction Severe: Ileo-transverso-colostomy. Death Thirty-six Hours later, Unrelieved by Operation.*

Mrs. P., aged 56, a patient of Dr. Watt, of Ayr, was seen on December 11th, 1908, on account of partial obstruction. She had been ill for six or seven months with abdominal "rumblings," and had latterly some pain and distension. The obstruction was not complete, and copious liquid motions were obtained by castor oil. Examination showed an elongated mass in the region of the caecum, and extending upwards along the ascending colon. I did not consider excision was possible, and advised short-circuiting.

Operation.—Median laparotomy. Widespread infection of peritoneum. Caecum was rolled up into a globular mass, which involved ascending colon. Anastomosis was made between lower part of ileum and transverse colon.

By the following day the pulse had gone up to 140; temperature was over 102° F. She vomited matter with a faecal odour, and there had been no movement of the bowels. She died in the evening, without having got any relief from the operation.

CASE VIII.—*Cancerous Stricture of Ascending Colon: History of Inflammatory Attacks in Region of Caecum: Ileo-transverso-colostomy.*

Mrs. H. B., aged 56, was sent into the Western Infirmary, Ward 29, on September 19th, 1908, by Dr. John Ritchie, on account of a hard mass palpable in the region of the caecum. About six months previously she experienced pain in the right iliac region, and on placing her hand there to support the part she felt the mass. The pain was not severe, and did not last longer than a few minutes. Ever since she has had occasional spasms of pain in the same region. Four months ago the mass became "inflamed." She was confined to bed for three weeks with severe pain, and for the first day or two vomiting was persistent. A second attack occurred seven weeks ago, and lasted for four or five days. She has lost flesh rapidly during the past two or three months; her bowels have been constipated for the past year, and for some months she has required purgatives. Apart from the acute attacks she has never had vomiting. Dr. Ritchie considered that while the acute attack resembled appendicitis, the case was probably one of malignant tumour. On admission she was very pallid and emaciated. A slightly tender large mass could be felt in the region of the caecum and ascending colon.

Operation.—On September 23rd the abdomen was opened through the right linea semilunaris. Inflammatory adhesions stretched from the front of the caecum to the iliac fossa, and to the ileum. The appendix was free. The ileo-caecal junction was pushed forwards by a mass (retro-peritoneal) which involved the postero-internal part of the caecum and was continuous with a tumour which constricted the ascending colon about its middle. Several enlarged glands were felt along the inner side of the colon. Ileo-transverso-colostomy was performed. No clamps were used, the bowel being steadied with toothed forceps.

Result.—She made an uneventful recovery and was discharged on October 24th.

I saw her on June 22nd, 1909. She says she is weaker than before, but she does not look any worse. Physical examination shows the mass still present, as above, but she has had no "inflammation" since she left the hospital.

CASE IX.—*Colloid Cancer of Caecum and Ascending Colon: Inflammatory Attack resembling Appendicitis: Secondary Nodules in Omentum: Ileo-transverso-colostomy: Death nearly Four Months later from Ascites, with Emaciation and Constant Vomiting.*

J. D., miner, aged 26, a patient of Dr. Marshall, Muirkirk, was admitted to the Western Infirmary, Ward 30, on August 13th, 1908, with a tender swelling in the right iliac fossa. For two months previously he had not felt well and had had practically constant pain in the right iliac region. The pain was mild and did not, as a rule, keep him from work, but fourteen days before admission it became very acute and was accompanied by sickness and vomiting. The vomiting ceased in a few hours, but the pain, although diminished, continued sufficiently severe to confine him to bed. On admission a distinct mass, which was dull on percussion, was palpated in right iliac region. Examination six days later, when pain and tenderness had quieted down, revealed a hard nodular mass, elongated vertically, in the right iliac fossa.

Operation.—On August 19th, abdomen opened through sheath of right rectus muscle being pulled inwards. The omentum showed numerous hard and brittle cancerous nodules varying in size from a small shot to a bean, and situated chiefly on the free edge of the omentum. The caecum and the lower part of the ascending colon were the seat of a hard nodular mass, and on the serosa of the lower part of the ileum were small whitish, shot-like nodules. One of the nodules on the omentum was removed for examination. Anastomosis was made between the ileum—about 8 in. from lower end—and the transverse colon, near the hepatic flexure.

Result.—He was discharged on September 12th, quite free from symptoms. The nodule removed showed histological characters of colloid carcinoma (J. H. Teacher).

Dr. Craig (Muirkirk) subsequently informed us that in one month after leaving hospital the patient began to go downhill, developed progressive ascites, and, after extreme emaciation and prolonged and obstinate vomiting, died on November 13th.

Of these four cases, two (Cases VI and VII) suffered from severe obstruction, and the comparatively long period of

relief given by the operation to Case VI was unexpected. The other two (Cases VIII and IX) suffered from inflammatory attacks which bore a resemblance to appendicitis; but in both this diagnosis was questioned by our finding a distinct mass after the subsidence of the inflammatory symptoms.

Of the three who recovered from the operation, one only (Case VIII) has had a prolonged respite—nine months when I last saw her. The others died three and four months respectively after operation, and one of them certainly from recurrence of obstruction. The outlook is not very cheering; but if the patient desires relief, I do not think that the surgeon is justified in refusing it, or at any rate in refusing to perform an exploratory laparotomy.

Class III.—*Colo-sigmoidostomy.*

In the case belonging to this class the seat of the disease in the colon necessitated the junction of the sigmoid with the transverse colon. The septic process, superadded to the malignant, was a grave complication, and his failure to rally from the operation is not surprising.

Case X.—*Adeno-carcinoma of Descending Colon with Colloid Degeneration and Septic Infection of Growth: Sigmoido-transverso-colostomy: Sudden Death a few Hours later.*

R. H., 47, baker, was sent into the Western Infirmary, Ward 30, September 15th, 1908, by Dr. Roxburgh (Troon), with the following history: Diarrhoea for eleven months, without any pain in abdomen; for eight weeks before admission persistent vomiting, generally one hour after meals; and great loss of weight. The patient was markedly emaciated, and a large fixed mass was palpable in the situation of the descending colon.

Operation.—September 18th. Abdomen opened through left linea semilunaris. A coil of small intestine was adherent over the mass. The adhesions were evidently inflammatory, and on separating opposing pieces of small bowel a stinking abscess cavity was opened. The abscess had no direct communication with the mass. The latter pushed forward the mesentery of the upper jejunum, and was at first thought to be enlarged glands. A piece was broken off by the finger during attempts to separate the mass, and the lumen of the colon was opened into. Subsequent investigation showed that the mass involved most of the descending colon. The opening was packed and anastomosis made between the sigmoid and the transverse colon.

Result.—He rallied by the evening, but died very suddenly before 8 o'clock. Histological examination of the tissue removed was made by Dr. Logan Taylor, who reported the condition to be adeno-carcinoma, with marked colloid degeneration, and septic infection of the growth.

Conclusion.

Lateral anastomosis was employed in all of the cases. In the group where entero-anastomosis was performed, the gut was placed in such a position that the occluded ends pointed in the same direction, and the strain on the anastomosis suture was lessened by additional stitches tacking together these ends.

The mesentery was cut close to its attachment to the piece of bowel to be resected, and its edge was puckered by segmental ligation; no infolding was practised.

In performing ileo-colic anastomosis the loop of ileum was in all cases turned so that its peristaltic wave would correspond in direction with that of the transverse colon.

In all, two layers of suture were employed, the one sero-muscular, usually silk, the other catgut, including all the coats of the bowel.

The method is satisfactory in both its performance and its results; but, as I have found in a recent case, the ingenious method of implantation described by Mr. Maylard[4] is, in circumstances where it is possible, more easily and speedily performed.

The foregoing cases present in themselves points of interest. They are given mainly, however, as an experience of the efficiency of intestinal anastomosis, whether demanded as a method of cure, or as a means of palliating suffering in an incurable condition.

References.

[1] *Glasgow Medical Journal*, December, 1908. [2] *Abdominal Tuberculosis*, London, 1908, p. 132. [3] Maylard, loc. cit., p. 144. [4] *Annals of Surgery*, May, 1909.

SECTION OF OPHTHALMOLOGY.

J. Walton Browne, B.A., M.D., President.

DISCUSSION ON DISEASES OF THE LYMPHOID TISSUE OF THE CONJUNCTIVA.

OPENING PAPERS.

I.—E. Treacher Collins, F.R.C.S.Eng.,
Surgeon, Royal London Ophthalmic Hospital.

Trachoma is a disease of such exceedingly long duration that few observers have the opportunity of watching cases from the commencement to the finish. In this respect I have had exceptional advantages. The Metropolitan Asylums Board has established ophthalmia schools for the isolation of children who, while under the charge of the Poor Law authorities in London, are found to be suffering from any contagious eye disease. The number of children admitted to these schools in the past five years—during which time I have held the appointment of ophthalmic surgeon to them—has been 2,441, of which 700 were suffering from trachoma. It is the outcome of the experience which I have gained at them that I now propose to lay before you.

Contagious Character.

That trachoma is a contagious disease has been proved by inoculation experiments. I have had, however, some very definite confirmatory evidence. When first one of these ophthalmia schools was started a "house mother" and an assistant nurse employed there contracted trachoma. In one case there was the history of some water having splashed into the woman's eye while she was engaged in washing a child who had trachoma, and it was from that time that the onset of the affection dated.

The way in which the disease started in these two cases is of interest because they were seen from the very commencement. In both the symptoms at first resembled those of an acute muco-purulent ophthalmia. There was swelling and redness of both ocular and palpebral conjunctiva, some papillary enlargement of the latter and muco-purulent discharge. The symptoms, however, did not yield to treatment in the satisfactory way which is usual in that affection, and when the congestion of the palpebral conjunctiva had somewhat subsided, the typical lymphoid follicles in the tarsal conjunctiva and the retro-tarsal folds became apparent. In one case the affection remained confined to one eye, in the other both eyes ultimately became involved. Both cases were cured after about eighteen months' treatment.

The contagious character of trachoma being definitely established, there can be little doubt that the contagious element is some micro-organism.

Trachoma Bodies.

During the last two years Prowazek and Greef, working independently, have discovered in the cells from trachomatous conjunctiva, by the use of Giemsa staining methods, minute slightly ovoid bodies considerably smaller than the smallest of the known cocci. They are found massed together in the cells near the nucleus in the form of a cap but separated from it by a clear space. The enclosure containing the granules enlarges rapidly, causing the cell to swell and ultimately burst, the granules then being discharged.

Contagion not Airborne, but Due to Transference of Moist Discharge.

Whatever may be the contagious element of trachoma, we may feel sure that it is one which is not spread through the air—that it is like many of the other organisms which give rise to contagious ophthalmia, easily killed by drying, and not spore-producing.

Adenoid Layer Chief Seat of Disease.

In some diseases of the conjunctiva due to microbic infection—for example, gonorrhoeal ophthalmia and diplobacillary ophthalmia—the organism is found chiefly in the epithelium. In others—for example, tuberculosis—the organism is located, not in the epithelium, but in the subepithelial tissue. A comparison of the histological

characters of a tuberculous nodule of the conjunctiva with those of a trachoma follicle would suggest that the position in which the trachoma organism is usually situated is like that of the tubercle bacillus, the fibro-adenoid layer.

Mayou[1] has pointed out that in trachoma follicles plasma cells are absent, though occasionally found in its outer zones. As there is good evidence to show that plasma cells are not very resistant to toxins, this arrangement of them is evidence that the intensity of the toxin is greatest in the centre of the follicle.

Prowazek insists that the ovoid bodies which he has found in cases of trachoma are met with only in the epithelial cells, not in the lymphoid cells. Greeff states that after a case has been treated with sulphate of copper these bodies disappear from the superficial cells and the secretion long before the case is cured. He suggests that they pass into the deeper parts, where they can still excite changes.

Wherever the trachoma organism is located, the changes which it or its toxin excite are most marked in the adenoid layer of the tarsal conjunctiva and the retrotarsal folds—that is, in those parts of the conjunctiva over which the epithelium is thinnest.

Most observers speak of the upper retrotarsal fold as the part which is generally first affected. Having seen, as already stated, many very early cases of the disease, I am inclined to consider the appearance of grey, scattered, avascular spots, rather smaller than a pin's head, in the tarsal conjunctiva of the upper lid as quite as early a symptom as the presence of follicular enlargements in the upper retrotarsal fold.

Elementary or Primary Granulations.

These grey spots have been termed "elementary or primary granulations" (v. Graefe, Jacobson). Their appearance is quite characteristic and of considerable diagnostic importance. Their presence when there is much muco-purulent ophthalmia in association with the trachoma, and consequently considerable congestion and papillary enlargement, is often obscured from view, and it is not until these other symptoms have subsided that they become visible.

The trachoma organism appears to be a non-pyogenic one, the reaction which is excited by its toxin being an immense new formation of lymphoid tissue, a large increase of plasma cells, and in the latter stages a formation of fibroblasts. Though in many cases of trachoma some polynuclear leucocytes are found in the discharge, they do not appear to be a consistent element, and when present can usually be attributed to infection with other organisms or the presence of other chemotactic substance. Mayou has pointed out that a characteristic of smear preparation obtained from trachomatous conjunctiva by gentle friction is the presence of an enormous number of plasma cells.

Trachoma a Chronic Disease; Acute Symptoms due to Mixed Infection.

Trachoma *per se* is essentially a chronic disease, the acute symptoms which sometimes usher in an attack, or which arise from time to time in the course of it, can always be accounted for by mixed infection. In the trachoma cases admitted to the ophthalmia schools I have frequently found organisms in the discharge, such as Koch-Weeks's bacillus and staphylococci, and when by appropriate treatment these have been eliminated the trachoma has remained as a chronic disease. In these schools, where the children's eyes are regularly bathed and attended to several times a day by skilled attendants, acute exacerbations of symptoms are very uncommon.

Koch while in Egypt in 1883 found in the conjunctival discharge in trachoma cases two different kinds of micro-organisms, the gonococcus and what is now known as the Koch-Weeks's bacillus. As neither of these is the specific organism of trachoma, the cases must be regarded as having had a mixed infection.

The descriptions which are given of the outbreak of ophthalmia in this country in 1801 and 1802 as the result of the return of Sir Ralph Abercromby's troops from Egypt, is that of an acute purulent ophthalmia, with rapid destructive ulceration of the cornea. Some of the cases later on, however, presented the characteristic cicatricial contraction and pannus of trachoma. I think that there can be little doubt that these cases were of a mixed character—of gonorrhoeal ophthalmia *plus* trachoma.

I think it is incorrect and misleading to speak, as so many of the textbooks do, of two types of trachoma—a papillary type and a follicular type. The essential element of trachoma is the follicle; it is the characteristic form of reaction on the part of the tissue to the irritation of the trachoma organism. Papillary formation over the tarsal conjunctiva, on the other hand, is present in many acute and chronic inflammatory affections. It may, it is true, exist with the follicles in trachoma, and sometimes be so extensive as to obscure them; but without the presence of lymphoid follicles we have no right to diagnose a case as one of trachoma.

Natural Destruction of Follicles by Rupture.

A characteristic of the trachoma follicles is their tendency to become confluent and produce bodies resembling in shape the grains of boiled sago. This running together of the follicles is most met with in the loosely attached tissue of the retrotarsal folds, but may occur in severe and more advanced cases in the more firmly attached tarsal conjunctiva. As the follicles increase in size the epithelium overlying them becomes thinned and the central part disintegrates until ultimately they rupture, a gelatinous contents escaping. On everting the lids in an advanced case of trachoma many follicles may often be seen just on the point of rupturing, and with a very little pressure their contents can be extruded.

Microscopical examination of a follicle which has been ruptured by expression shows (as pointed out by Mayou) invasion of its walls and cavity by polynuclear leucocytes, due, he suggests, to the presence of septic organisms from the conjunctival sac, or possibly, I would suggest, to chemotactic action set up by products eliminated from the damaged epithelial cells.

By Absorption.

It has been long recognized that chronic cases of trachoma may be considerably benefited by an acute inflammatory attack. Microscopically it has been found that the trachoma follicles may become invaded from the periphery by polynuclear leucocytes. Such cells do not form part of what may be considered the normal constituent of a trachoma follicle. When, however, an exudation of these highly phagocytic cells is brought about by pyogenic organisms, or the application of some irritant to the conjunctiva such as jequirity or sulphate of copper, they will invade the follicles and effect their absorption.

Besides the follicular formation in trachoma, there is a considerable formation of plasma cells immediately beneath the epithelium between and beneath the follicles, also in the later stages a formation of fibroblasts.

Stellwag's Brawny Oedema.

In the later stages of some cases plasma cells may undoubtedly break down and produce a hyaline material which gives rise to the condition known clinically as "Stellwag's brawny oedema." In it portions, sometimes large areas, of the palpebral conjunctiva have a smooth surface and waxy, gelatinous appearance. This condition is similar, though more extensive, to the milky, opalescent appearance of the surface of the conjunctiva met with in spring catarrh, which is produced not, as was at one time thought, by a thickening of epithelium, but by a hyaline degeneration of plasma cells immediately beneath the epithelium.

Fibrous Tissue Formation and Destruction of Follicles by it.

The fibrous tissue which forms in trachoma is probably mainly developed from fibroblasts derived from connective tissue cells. It makes its appearance either as strands and irregular networks, or over a large area which loses its transparency and becomes a dull yellowish-white colour. The formation of fibrous tissue and areas of hyaline degeneration are often associated in the later stages of the disease. The fibrous tissue, as it forms, replaces the adenoid layer; it destroys the trachoma follicles partly by forcing them to the surface, where they rupture, and partly by compressing them, and in its

[1] *Changes Produced by Inflammation in the Conjunctiva*, 1905, p. 111.

contraction causing them to shrink. Some small superficial scar areas are no doubt formed at the seat of the ruptured follicles, but the most extensive growth of fibrous tissue begins in the deeper layers of the membrane and extends forwards to the epithelium.

It is possible for very extensive replacement of the adenoid layer by fibrous tissue to take place without much distortion of the lid being produced. It is the formation of fibrous tissue in the form of a longitudinal band along the line of the sulcus subtarsalis (Arlt's scar streak), which most frequently gives rise to entropion and boat-shaped lid.

Similarity of Palpebral Conjunctiva in Late Stages of Trachoma to Skin.

The palpebral conjunctiva differs from skin in the following three particulars:

1. The thinness of the epithelium. Over the tarsus the epithelium of the conjunctiva has only two layers of cells; there is no prickle layer and no keratinized layer.
2. The absence of papillae.
3. The presence of the adenoid layer immediately beneath the epithelium instead of the dense fibrous tissue of the corium.

The thinness of the epithelium of the conjunctiva exposes it to greater risk of microbial infection than the skin. The lymphoid tissue, or the potentiality for the formation of lymphoid tissue, immediately beneath the epithelium, limits the risk of general systemic involvement from any such infection.

In severe and long-standing cases of trachoma, immediately beneath the epithelium of the palpebral conjunctiva, fibrous tissue is formed similar to that of the corium of the skin, which like it is raised into papillae. Instead of being composed of only two layers of cells the epithelium is thickened into several layers, the surface ones being flattened and squamous; it also sends down numerous finger-like processes between the papillae. In some cases these processes are converted into gland-like structures, the orifices of which may become occluded, small retention cysts being formed. These little retention cysts are seen clinically as small yellow-coloured patches about the size of a pin's head. If from the contraction of the new-formed fibrous tissue the ducts of the lacrymal and other conjunctival glands become obliterated, so that the membrane is no longer kept moist, then its resemblance to skin becomes still more marked, keratinized layers of epithelial cells being formed on the surface, and the condition termed "xerosis" being established

Possibility of Cure of Trachoma Without Formation of Fibrous Tissue.

I have seen several cases treated at the Ophthalmia Schools for characteristic trachoma follicles in the tarsal conjunctiva and retrotarsal folds, which, on leaving, have shown no sign of fibrous tissue formation sufficient to have revealed the fact that they had suffered from the disease.

Pannus the Result of Abrasion of Corneal Epithelium and Infection.

There has been much discussion as to whether the vascular affection of cornea which is met with in trachoma, termed "pannus," is the result of irritation from a roughened eyelid or a real infection of the cornea with trachoma. I would suggest that it is the outcome of both.

The formation of lymphoid tissue in a structure like the cornea, devoid of any normal lymphoid tissue, serves to show that a trachoma follicle is not a mere hypertrophy of pre-existing lymphoid tissue; but that it is a new production for the purpose of defence against the attacking organism.

Treatment.

A study of the natural history of trachoma, as above described, serves to show that the lymphoid follicles which form in connexion with it, are eliminated in three different ways.

(*a*) By rupture of the follicles on the surface and discharge of their contents.

(*b*) By intercurrent inflammation causing follicles to become invaded with polynuclear leucocytes and absorbed.

(*c*) By the replacement of the adenoid layer by fibrous tissue, which, cutting off the blood supply to the follicles, causes them to atrophy.

Of the immense number of different treatments which have been employed for trachoma, those which have proved most efficacious can, I think, be shown to aid in getting rid of the lymphoid tissue in one of the three above-mentioned ways.

Expression.

In the operation of expression a large number of follicles are ruptured and their contents evacuated. If, immediately after expression, the surface of the ruptured follicles is painted with a 1 in 100 solution of perchloride of mercury, an exudate into them of polynuclear phagocytic leucocytes is excited which promotes absorption of the remains of the follicles.

In the operation of expression, I prefer to use the flat Grady's forceps rather than Knapp's roller forceps. With the latter I find, unless exactly the right amount of pressure is made, there is a tendency to tear the tissue. My endeavour always is to squeeze, and not to tear.

In performing the operation I employ two pairs of expression forceps, holding the upper lid everted with one pair, and with the other grasping the retrotarsal fold and squeezing the follicles out of it. In the tarsal conjunctiva it is frequently impossible to get rid of the follicles by expression owing to its firm attachment to the tissue beneath. The so-called "elementary or primary granulations" cannot be squeezed out of the tarsal conjunctiva. To get rid of all the lymphoid follicles from the retrotarsal fold it is often found necessary to repeat the procedure of expression at several different sittings. Even when all follicles seem to have been completely removed from the retrotarsal fold, if the disease is not cured in other parts of the conjunctiva, fresh ones make their appearance which in their turn have to be expressed.

Excision of Retrotarsal Folds.

The operation devised by Galezowski of excision of the retrotarsal folds is a very effectual way of getting rid of the follicles and shortening the duration of the disease. I have performed it several times, in cases where there has been much redundance of tissue behind the tarsus. In some cases I have removed all four retrotarsal folds, with satisfactory results.

Removal of Tarsus and Conjunctiva.

Kuhnt's operation of removal of the tarsus and conjunctiva which covers it I have not performed, not having met at the Ophthalmia Schools with cases which I thought sufficiently severe to justify the employment of so radical a procedure.

Sulphate of Copper.

Time-honoured sulphate of copper still, I think, maintains the foremost place as the best application in trachoma to stimulate the absorption of follicles which cannot be removed by expression. The reason why a copper salt proves specially useful for this purpose is, I think, to be found in the experiments of Leber. He introduced into the anterior chambers of the eyes of rabbits sterilized substances of different chemical characters, and found different kinds of reaction followed. Thus pieces of gold and glass excited no inflammation, slowly becoming encapsuled by a delicate connective tissue. Pieces of copper or drops of quicksilver, introduced in precisely similar manner, gave rise to a localized suppuration; whilst croton oil and cantharides caused no pus-formation, but a fibrinous exudate with necrosis of tissue. Copper or its salts, then, applied to the conjunctiva in a similar way, probably sets up a mild aseptic purulent inflammation—that is, an exudate of polynuclear leucocytes which will invade the trachoma follicles, and tend to bring about their absorption.

Kataphoresis.

In several cases I have endeavoured to increase the efficacy of the copper treatment by forcing it into the tissue by kataphoresis. The process is a decidedly painful one and is followed by considerable hyperaemia. It is more painful than the application of the sulphate of copper stick, and I cannot say that so far I have found it any more efficacious. I have also, at the suggestion of Dr. Lewis Jones, tried treating the follicles in trachoma by puncturing them with a copper needle and then passing through it a current of 2 to 3 milliampères for one minute. The haemorrhage and hyperaemia occasioned prevents more

than one or two follicles being dealt with satisfactorily at one sitting, but by it their absorption certainly seems to be promoted.

Wirtz[2] in an article on "Ionic Therapeutics in Ophthalmology" says that in trachoma he has used ½ per cent. solution of copper sulphate with 2 to 3 milliampères for two to three minutes every few days, and that in 4 acute cases, after four weeks, the conjunctiva was nearly normal, and four chronic cases were discharged cured, "as far as one can speak of cure in trachoma."

In former times a more violent reaction than that excited by sulphate of copper was effected by the inoculation of gonorrhoeal matter. Mackenzie[3] in writing of this practice says, "Although it by no means appears a very safe one, it is undeniable that cures have been effected of the hypertrophied state of the conjunctiva, with the vasculo-nebulous condition of the cornea depending on it."

The immense exudation of phagocytic polynuclear leucocytes which was in this way excited doubtless led to the invasion and disappearance of many of the follicles. It can be easily understood that in a tissue normally avascular like the cornea an increase in leucocytosis would be specially useful in promoting absorption of the lymphoid material.

Jequiritol.

On the introduction of jequirity the use of gonorrhoeal matter with its uncertain amount of reaction was abandoned. Now, with Merck's extract of abrin, which has received the name "Jequiritol," we have a most efficacious means of exciting by a chemical irritant an acute inflammatory attack of limited duration. I have frequently employed it in cases with pannus with good effect. One application of Merck's strongest jequiritol usually suffices to produce the desirable amount of reaction. I have never found it to be so excessive as to necessitate the use of the antiabrinic serum.

X Rays.

The *x*-ray treatment of trachoma has the advantage over all other methods of treatment in being painless. It was first introduced by Mayou in 1902, who in writing of it says[4]: "In the *x* rays we have a method of setting up a leucocytosis with the absolute minimum of destruction of epithelial or other tissues; and further, we have a means of producing an inflammation, varying from a very slight leucocytosis to an actual gangrene of the part, which with due care and experience we have under almost perfect control." At the Ophthalmia Schools the *x*-ray treatment has been largely employed for trachoma with variable results. These exposures are repeated each day for ten days, and are then stopped for ten days; if at the end of that time little or no reaction has been set up, applications for another ten days are made.

Some cases treated in this way have steadily improved, follicles disappearing and pannus, when present, clearing up. Some, on the other hand, after very prolonged use of the rays, have shown but little amelioration. In no case have any disagreeable consequences been occasioned from the employment of *x* rays in the cautious way above described. The varying results are doubtless to a great extent attributable to varying degrees of dosage according to the hardness or softness of the tube employed. It would be very advantageous if some method for regulating the dosage in the *x*-ray treatment of trachoma could be introduced, similar to the use of the Sabouraud and Noiré pastilles in the treatment of ringworm by *x* rays.

Radium.

In 1904 I tried treating cases of trachoma with radium. A 5 mg. glass tube of radium bromide of low radio-activity was held over the everted eyelids for five to seven minutes daily. This was continued for from three to ten weeks before any definite reaction ensued. The results were not very encouraging. Probably with the improved apparatus for the application of radium introduced by Drs. Wickham and Degrais and longer exposures more satisfactory effects might be obtained. Success in the treatment of trachoma by radium has been reported by Cohn,[5] Thieleman,[6] and Sclenkowsky.[7]

Grattage.

The third method by which a natural cure of trachoma is effected is, as already stated, the replacement of the adenoid layer by fibrous tissue. I would suggest that some of the more violent mechanical methods of treating trachoma which have been attended by good results act to a large extent by stimulating this natural tendency to fibrous tissue formation. The methods I refer to are those which may be included under the comprehensive term "grattage," whether carried out with a hard brush, a spiked iron instrument, or a knife blade.

Possibility of Curing Trachoma.

I may conclude describing my experience of the treatment of trachoma by saying that I have found it possible to so thoroughly eradicate the disease that it shows no tendency to relapse. In cases where a relapse seems to have taken place I believe the disease was never completely cured, or that some other inflammatory conjunctival infection (such as that due to Morax's diplobacillus) has become implanted in an eye showing the fibrous tissue sequelae of trachoma.

I always mistrust statements as to the cure of trachoma in the course of a few weeks. Rapid and striking improvement in some cases is often made by treatment in the first weeks, but the complete cure of the disease, in my experience, always takes several months, and sometimes years, whatever procedure be adopted.

I do not consider any case as satisfactorily cured so long as any follicular enlargements can be detected in any part of the conjunctiva, or abnormal discharge persists. To ensure that all follicular enlargements have been got rid of a most careful scrutiny of the conjunctiva and all its folds has to be made. As an aid to such examination I have found the binocular magnifier, a modification of Berger's stereoscopic loupe, made for me by Messrs. E. W. Dixey and Son, of the greatest assistance.

It is probable that when the conjunctiva has its adenoid layer replaced by fibrous tissue its powers of resisting the attack of micro-organisms becomes lowered. I have frequently seen cases with fibrous tissue formation in the conjunctiva of long standing become the subjects of fresh attacks of inflammation. An examination of the discharge has revealed the presence of Morax's diplobacillus, and the use of sulphate of zinc has soon cured the inflammation. Such cases were clearly not recurrences of trachoma.

Reappearance of Pannus not Necessarily a Recurrence of Trachoma.

I do not think that the reappearance of a vascular condition of the cornea as an accompaniment of fresh inflammation in an old case of trachoma necessarily implies a recurrence of that disease. We know that the tracks of the blood vessels in the cornea, when pannus subsides, never completely disappear. Slight causes will sometimes lead to their fresh distension with blood. I have known it to occur as the result of an injury, and I believe it may follow on any undue hyperaemia of the conjunctiva, such, for example, as that produced by some form of intercurrent conjunctivitis.

Diagnosis.

Whether or not the presence of "Prowazek granules" or "trachoma bodies" is to be regarded as a diagnostic sign of trachoma has yet to be decided. Clausen,[8] writing on this point, says: "The individual granules cannot be recognized with certainty, or considered as forming a standard for the diagnosis of trachoma, but when the specific granules are present, whether the small or large ones, absolutely specific clusters of them can be found near the nuclei of the epithelial cells or else lying free."

So far the differentiation of trachoma from other affections, characterized by the presence of follicular enlargements, has rested on a clinical basis.

The close histological resemblance of the follicles whenever enlarged has led some observers to regard all conditions in which such enlargements are met with as stages of one and the same disease. Most, however, are now

[2] *Klinisch monatsblat. f. Augenheilk.*, November-December, 1908, and *Ophthalmic Review*, May 1909, p. 149.
[3] *Diseases of the Eye*, fourth edition, p. 647.
[4] *Changes Produced by Inflammation in the Conjunctiva*, p. 140.
[5] *Berl. klin. Woch.*, No. 1, 1905.
[6] *Zeitschr. f. Augenh.*, December, 1905.
[7] *Arch. f. Augenh.*, Bd. lx, 1908, Heft 1, S. 63.
[8] *Trans. XI Congresso Internazion. di Oftalmol.*, 1909, p. 854.

prepared to agree that there is one affection characterized by follicular enlargements which are liable to be followed by fibrous tissue formation in the palpebral conjunctiva and involvement of the cornea with pannus, and other affections accompanied by follicular enlargements which never under any circumstances have such sequelae.

In countries where trachoma is rife and where the majority of the inhabitants suffer from it, the recognition of different classes of cases with follicular enlargement is very difficult.

In countries or localities where the disease which has the serious sequelae—namely, trachoma—does not occur, the occurrence of affections accompanied by follicular enlargements without such sequelae is readily realized.

Other Conditions than Trachoma with Enlarged Follicles.

The conditions in which non-trachomatous follicular enlargements occur may be classified as follows:

(*a*) In atropine and eserine irritation.
(*b*) In children with a general tendency to adenoid formations.
(*c*) In muco-purulent ophthalmia.

Careful examination of the retrotarsal folds reveals small follicular swellings in a very large number of children who make no complaint of their eyes, who have no abnormal discharge from them, and no undue redness. Such children are frequently found to be also the subjects of new formation of adenoid tissue in the pharynx and nasopharynx. In some children these follicular enlargements in the conjunctiva may be very numerous, especially in the lower retrotarsal fold. They form rows of little rounded protuberances, never bigger than a pin's head, and have no tendency to run into one another and become confluent. When large their presence may give rise to some irritation, causing the child to rub its eyes, or giving rise to blepharospasm. In such cases hyperaemia or inflammation may become superadded. The diagnosis of this form of follicular enlargement from trachoma in its early stages rests on the position, size, and non-confluent character of the follicles. They are always located in the retrotarsal folds, never larger than a pin's head, and do not run into one another. In the later stages of trachoma the tendency to fibrous tissue formation or involvement of the cornea are characteristic features.

To diagnose such cases from early cases of trachoma which commence as a mixed infection with acute symptoms is often a matter of extreme difficulty. Indeed, in some it seems to me impossible to be quite sure of the diagnosis until the cases have been watched carefully for some weeks.

Other Conditions than Trachoma with Fibrous Tissue Formation.

The presence of fibrous tissue formation in the conjunctiva, though such a frequent accompaniment of trachoma, is not pathognomonic of that affection. Besides occurring in the process of cicatrization of injuries and burns it may also be an accompaniment of other diseases.

In tubercle, in pemphigus, and in severe membranous ophthalmia portions of the conjunctiva become destroyed by ulceration. In the treating of these ulcers fibrous cicatricial tissue forms, producing an appearance closely resembling that seen in the late stages of a bad case of trachoma. So close may the resemblance be that the nature of the affection from which the condition arose can only be diagnosed by careful study of the history of the case.

Spring catarrh is another disease of the conjunctiva in which an extensive new fibrous tissue formation takes place. In this affection, unlike those first mentioned, the new-formed fibrous tissue is not cicatricial fibrous tissue; it is not produced as a sequela of ulceration. It is one of the primary essential features of the disease. It grows forwards from the deeper layers, replaces the adenoid layer, and forms on the surface of the membrane the characteristic flat-topped elevations. In its non-cicatricial character it resembles much of the fibrous tissue formation in trachoma, and the two diseases are also alike in the formation of large numbers of plasma cells, which undergo degeneration, forming the hyaline material already referred to. Spring catarrh differs, however, from trachoma in the complete absence of follicular formation, and also, as was first pointed out by Herbert, in the development of immense numbers of eosinophiles. A remarkable feature of the fibrous tissue formation in spring catarrh is the way in which it disappears as the disease subsides. It produces no contraction, and leaves little, if any, sign of its former presence.

II.—Professor Dr. Richard Greeff,
Berlin.

THE ETIOLOGY OF TRACHOMA.

[Abstract.]

Professor Greeff said that in response to the invitation he had received he had the pleasure of reporting the recent progress which had been made in the etiology of trachoma. In common with many authors he had always been of opinion that trachoma was a definite specific infective disease. During the last fifteen years many workers had been engaged in attempting to elucidate the etiology of the disease without any striking result, and with the then known methods of investigation he had come to the conclusion that it was not possible to determine the microbe. While investigating the *Spirochaeta pallida* with different methods of staining, he applied the same to search for the trachoma microbe, and in the base of the new staining methods of Romanowsky and Giemsa he was led to take up the subject once more. In common with other observers he found on the surface of the conjunctiva organisms belonging to the spirochaete family, not only in trachoma but in other conjunctivae which had been irritated for any length of time, and also in the mouth, but they were only saprophytes. Using Giemsa's stain, which had brought about such excellent results in protozoon diseases, such as malaria, he was able to obtain characteristic results in trachoma.

He had found many round cellular inclusions which were much more minute than the smallest known cocci, and they stained intensely, sometimes violet and sometimes reddish or blue, with "Giemsa" diluted with aniline, and not at all with "Gram," and they were surrounded by a distinct zone. With the highest powers they were seen to be not quite round but slightly oval, like bacteria with rounded extremities, and grouped in pairs. If intracellular they lay close to the nucleus. They were found in the epithelial cells in the discharge, in the pressed-out follicles, and, in short, everywhere. At the same time two physicians, members of a committee appointed to investigate syphilis in Iowa, published a paper on the same subject, and comparing the two discoveries, it was clear that they had found the same bodies in Iowa as he had discovered in Germany.

He first called them "double bodies" because at times they sometimes lay in pairs, but this name was not suitable for all conditions. He consequently discarded this name and termed them "trachoma bodies."

(The author then showed a number of lantern slides. Fig. 1 showed the development of the trachoma bodies when intracellular. Here the double bodies were seen in the protoplasm. In Figs. 2 and 3 dark blue stained spots were seen close to the nucleus. In Figs. 3 and 4 were what the author termed the "mass form" of trachoma bodies. This was the most frequent form they assumed, and they were easiest to see. In Fig. 5 the mass was surrounded by a distinct and clear mantle, but in the earlier stages seen in Figs. 1, 2, 3, and 4 the mantle had not made its appearance; it was incomplete in the later stage, Fig. 6, and had entirely disappeared in the last drawings. The mantle was, therefore, only characteristic of one stage. Fig. 7 showed a swollen cell densely packed with granules while in another the cell had burst and the granules were set free in their surroundings. As this bursting occurred only in cells filled to overflowing with granules, he was of opinion that the bursting was a natural process and in no way due to the reagents used. The best results were obtained by a modified Giemsa method, which he described.)

As the trachoma bodies were so frequently seen in the epithelial cells, several authors considered trachoma to be a purely superficial disease confined to the epithelium; but he did not agree with this theory, for the following reasons:

1. Clinically it was known that the disease went very deeply into the tissues, even intruding into the dense tarsus and finally destroying it.

2. In cases where the trachoma bodies were numerous they absolutely disappeared on the surface after a few

days of treatment, but they soon reappeared if the treatment was stopped. This he took to indicate that although absent on the surface they were still present in the deeper structures, and thus working their way to the surface and causing a relapse.

3. He had succeeded in finding the granules in the squeezed-out follicles, but the matter was thus always contaminated by the surface cells. In order to avoid this he had now succeeded in finding them in the follicles cut in section, and this showed them not only in the epithelial cells, but also in the subepithelial tissue, in the lymph spaces beneath it, in the cells of the follicles (the lymphoid and so-called Leber's cells), and between the cells

Owing to the many failures in the past, objections constantly arose in his mind, and so for a long time he did not publish his results. First, it was necessary to prove that these formations were present in cases of trachoma only. This he had now done, and had proved that they never occurred in simple or follicular conjunctivitis, diphtherial, gonorrhoeal, or venereal, etc. On the other hand they were found in every fresh case of trachoma examined in various countries and cities, and were constantly present. He was able to prove that the bodies were different from all known cell degenerations, and special care must be taken not to confound them with the eosinophile granules in the leucocytes. These could be seen growing in the cells, and disappearing under treatment. Therefore it was probable they were living agents. Thus it was proved that the much sought after organism had finally been found. It would be premature to put them in the zoological series; they certainly were not bacteria, but appeared to be more allied to protozoa.

DISCUSSION.

Professor Ernst Fuchs (Vienna) said that after the discovery of the trachoma microbes by Prowazek, and in the second place by Professor Greeff, the trachoma cases in his clinic had been examined with regard to the presence of the trachoma microbes. One of his assistants, Dr. Lindner, was devoting much of his time to these researches. He stated that the trachoma microbe was present in a large number of the trachoma cases, acute and fresh cases as well as old and chronic cases. In early cases, as well as in chronic and in treated cases, the microbes were mostly found only in the upper retrotarsal fold; in fresh and more acute cases they were found all over the conjunctiva, and in one case they could be detected even in the epithelium covering a fresh pannus. The microbes could be shown in the scraped-off epithelium as well as in sections through the conjunctiva. They were to be found only in the epithelium, never in the conjunctival tissue or the follicles, so that they might regard trachoma as a pure epithelial infection. The appearance of the trachoma microbes had been found to be as Prowazek had described it. The presence or absence of the trachoma microbe might be a very valuable means of ascertaining the diagnosis in doubtful cases. He mentioned in particular the case of a man taken into the clinic with a gonorrhoeal opbthalmia; after a fortnight's treatment, the swelling of the conjunctiva having subsided to a certain degree, a great number of follicles appeared. The question whether these follicles were to be regarded as a sequel of the gonorrhoeal infection, or as belonging to a trachoma pre-existent to the gonorrhoeal infection and unnoticed by the patient, was settled in favour of a pre-existing trachoma by the proof of the presence of the trachoma microbes.

Mr. Sydney Stephenson (London) remarked that when he first was brought into contact with trachoma amongst the Poor Law children of London there was great confusion between follicular conjunctivitis on the one hand, and trachoma on the other. The former was commonly regarded as an early stage of the latter. In order to settle this point he examined the eyes of about 15,000 children in schools of every class outside the parochial ones, and he found that the conjunctiva was free from follicles in only about 5 per cent. This observation made the theory named above quite untenable. It led him to distinguish between single folliculitis and specific folliculitis or trachoma. He agreed that trachoma was not airborne, and gave examples from his own experience to prove that it was due to contagion—that is, actual transfer of morbid material—and on that view he had formerly succeeded in extirpating trachoma from the schools at Norwood, and from the Central London District Schools at Hanwell.

Mr. J. A. Craig (Belfast) dealt with the question of the great prevalence of trachoma in the industrial schools in Ireland, and pointed out the danger to the community which resulted from this. He referred to the want of any attempt on the part of the Legislature to prevent its admission to the country and its subsequent spread. Proceeding to the etiology of the condition, he stated that in a number of cases where nurses had become infected the incubation period had apparently been very short, and the onset and progress of the cases had always been that of an acute trachoma. The progress of the disease when occurring in healthy individuals living under suitable hygienic conditions was always more favourable than in poorly nourished and unhealthy patients, and in these cases, with suitable treatment, a fairly speedy recovery without visible cicatrization was common. He deprecated the employment of too vigorous surgical treatment, and asserted the superiority of sulphate of copper over other medicinal remedies in the treatment of chronic trachoma when the chief clinical feature was the presence of the typical granulations.

Dr. Joseph Nelson (Belfast) said that with regard to the prevention and treatment of trachoma more attention than was usually given was needed. All were agreed as to ordinary local, constitutional, and hygienic measures, but he contended that the latter were not carried out as fully as they ought to be. They knew and recognized the difficulties amongst the poor and in schools and institutions of limited means owing to the expense that might be incurred. He held that the powers or authorities—local and Imperial—ought to step in and help, by money if need be, but in all cases enforce what might be necessary in trying to stamp out this terribly contagious disease. Without doubt properly-arranged methods would not only relieve the afflicted patients, benefit the community, prevent blindness, raise the physique of their own nation, but it would also cement international relations, and all that with true economy. He suggested that the Section should pass a resolution calling attention to the matter.

Professor W. Gordon Byers (Montreal) suggested to the Section that the question of trachoma in Great Britain was one that might with advantage be brought to the attention of the Government. In Canada, thanks especially to the efforts of the Hon. Mr. Monk, the Dominion Parliament had, during the last few years, taken steps which had markedly checked the spread of granular conjunctivitis in the country.

Mr. Treacher Collins moved:

> That the Council of the British Medical Association be asked to draw the attention of the Local Government Boards of the United Kingdom to the prevalence of trachoma amongst the lower classes, to the damage to sight which it frequently entails, to the contagious character of the discharge from the eyes of those affected, and to the importance of preventing any transference of such discharge from one person's eyes to another by the washing appliances in the institutions under their control.

The resolution was adopted.

A CASE OF SARCOMA OF THE CHOROID.

By James Hinshelwood, M.A., M.D.,
Surgeon to the Glasgow Eye Infirmary.

The patient, a man 36 years of age, was first seen by me in May, 1906. He was complaining of defective vision in the right eye. He stated that two and a half years previously he had first noticed a distinct visual defect in the right eye. This defect, when first observed, was only a slight blurring of vision, but this had slowly and gradually increased up till the time I saw him, and had been becoming rapidly worse of late. There had never been anything abnormal about the external appearance of the eye, nor had there ever been the slightest pain or discomfort of any kind. He was in excellent health, and said that he had always been a very healthy man.

On examination, the external appearance of the eye and the tension were absolutely normal. On testing the vision of the right eye, I found that the central area of the field was abolished, but that he could count fingers easily and recognize large objects in the peripheral parts of the field. On ophthalmoscopic examination, there was seen at the posterior pole of the eye, slightly below and to the temporal side of the optic disc and involving the macular region, an area in which the retina was slightly raised above the surrounding parts. This area was greyish in colour, and there were no folds observable, nor were any undulations visible on movement of the eye. The condition was regarded as probably due to an exudative choroido-retinitis.

I saw the patient again in May, 1908, two years later. He had had no discomfort whatever with the eye during that period, but his vision had become much worse. He could no longer count fingers, but could only see in the periphery of the field very large objects in a dim way. On ophthalmoscopic examination it was seen that the area of retinal detachment, previously noted below and to the outside of the optic disc, had become much more prominent and projected considerably into the eye. The surface could be seen distinctly with a + 6 D. lens. The external appearances of the eye and the tension were still absolutely normal. A tumour in the eye was diagnosed, but the patient would not consent to excision, as he had no pain or discomfort whatever, and said he would prefer to wait for a time.

I saw the patient again in February, 1909. He had had no discomfort since his previous visit. On ophthalmoscopic examination it was evident that the growth was rapidly increasing and projecting further into the eye. The surface of the projecting mass could now be best seen with a + 10 D. lens. Tension and external appearance still normal.

I strongly urged removal of the eye, as there was no doubt that the growth was rapidly increasing. After some hesitation, the patient allowed me to enucleate the eye on March 2nd, 1909, nearly three years after the time I first saw him. I have seen the patient quite recently. The socket is quite healed and normal in appearance, and he is in excellent health. The eye was examined by Dr. Leslie Buchanan, late Pathologist to the Glasgow Eye Infirmary, and he has kindly furnished me with the following report:

> The eye is normal in size and shape, and there is no evidence of external propagation of the tumour growth. The anterior segment of the eye presents normal characters and the iridocorneal angle is open and the filtration spaces free. In the posterior segment, the retina is raised over a tumour, which is growing from the choroid at the temporal side of and slightly below the optic nerve entrance. The optic nerve entrance itself is not visible, being overgrown by the tumour. The tumour presents a somewhat flattened dome shape merging gradually into the choroid, except at the upper part, where a nodule of similar structure projects forwards from it. The growth measures 13 mm. in its largest diameter and attains a height of 6 mm. at its centre, but the nodule above mentioned rises about 4 mm. above this. The mass is non-pigmented. The base of the tumour has its centre almost in the macular area or slightly below it. The retina is raised over and firmly adherent to the surface of the tumour mass, and is overlain, as it were, by a projecting edge of the nodule at the upper part. Histologically the growth is a spindle-celled leucosarcoma. There is no evidence to show that the growth has invaded the sclera or the optic nerve, although the latter is completely overlain by it.

Leucosarcoma is much less common than the melanotic variety. According to Fuchs,[1] about nine cases of melano-sarcoma occur for every one of leucosarcoma. Leucosarcoma is said also to be met with, on the whole, at an earlier age than melano-sarcoma. Whilst melano-sarcoma is most frequently met with between the ages of 40 and 60, my patient was 36 years of age when I first saw him, and the growth was probably present at least two and a half years before that.

The case reported is especially noteworthy for the long period during which there were absolutely no symptoms apart from gradually increasing loss of vision. This period has been named the first stage, in contrast to the second or glaucomatous stage, when increased tension with pain and other symptoms dependent upon increased tension appear. Then comes the third stage of extraocular extension, when the tumour bursts through the envelopes of the eye; and finally comes the fourth stage, that of metastasis, the development of metastatic nodules in the internal organs.

Early diagnosis is, of course, very important in the first stage of the disease, and hence every clinical fact observable in this stage is of the utmost importance. The case reported is specially remarkable for the long duration of this stage. If we seek information in books as to the duration of this stage, it is rather vague as a rule. Parsons[2] says in most cases the first stage lasts about half to one year, but may last several years. Berry[3] says that the average duration of the first stage is from eighteen to twenty-one months, the lower limit being for cases of sarcoma of the ciliary body, the higher for those of the choroid proper. In many cases, he says, no doubt the period intervening between the first appearance of the growth and the occurrence of irritation is longer, but escapes observation. Fuchs[4] says that the first and second stages last a long time, whilst afterwards the growth of the tumour becomes continually more rapid.

The present case illustrates the truth of Dr. Berry's observation that in many cases the period intervening between the first appearance of the growth and the occurrence of irritation is longer than the average of eighteen to twenty-one months generally given, but escapes observation. The first symptom is failure of vision, and this will occur at a very early period only if the growth is situated in or near the macular region. I first saw the patient in May, 1906, and he was very clear and positive that the visual defect in his right eye was observed by him at least two and a half years previously. I removed the eye in March, 1909. This gives a period of nearly five and a half years for the duration of the first stage, during which there were absolutely no subjective symptoms apart from gradual and progressive loss of vision in the affected eye.

When a patient presents himself with a detachment of the retina in an otherwise healthy eye without myopia or without any history of injury, the possibility of its being due to a tumour of the choroid should never be lost sight of, and the patient should be kept under very careful and continuous observation. If the detachment of the retina be near or in front of the equator of the eye, great help in the diagnosis may be had from the use of transillumination of the globe. This method has been well described in detail by Stephenson.[5] But when the detachment is at the posterior pole of the eye, as in the present case, transillumination is impracticable and can afford us no help. The diagnosis in such cases must depend upon the ophthalmoscopic appearances as revealed by successive examinations and the careful study of the progress of the detachment.

The clinical lesson to be learned from a study of the present case is that a very long period of increasing visual defect, in the case reported extending to nearly five and a half years, without elevation of tension, without pain or any other subjective symptom, is quite compatible with the diagnosis of sarcoma of the choroid.

References.

[1] Fuchs, *Das Sarcum des Uvealtractus*. [2] Herbert Parsons, *The Pathology of the Eye*, vol. ii, p. 498. [3] Berry, *Diseases of the Eye*, p. 349. [4] Fuchs, *Textbook of Ophthalmology*, p. 388. [5] Sydney Stephenson, *The Ophthalmoscope*, December, 1908.

DISCUSSION.

Mr. Johnson Taylor (Norwich) stated that many years ago he published a case in the Ophthalmological Society's *Transactions* of a leucosarcoma at the yellow-spot region, with a clear history of defect of sight for eleven years. He removed the eye, and the patient is, as far as he knows, still alive and in good health.

Mr. Devereux Marshall (London) said that the line of demarcation between a leucosarcoma and a melanotic sarcoma was very difficult to define, for however devoid of pigment a choroidal sarcoma appeared to be to the natural eye, it was always possible to find a certain amount of pigment microscopically. As regards the question of tension, he laid but little stress upon it as a point of diagnosis. The tension was entirely dependent upon whether the angle of the anterior chamber was closed or open, and this was altogether independent of the size or the presence of the tumour. In examining a large number of cases he found that if the tumour was situated far back

a considerable number had increase of tension, and the rest had normal tension, and it was the rarest thing to find the tension below normal. If, however, the growth involved the ciliary body, a good half of them never had any increase of tension at all, a fair number had *minus* tension, and some *plus* tension. To fail to diagnose a sarcoma just because the tension with a detachment present was not raised, was one of the most foolish things to do. Even now it was not fully recognized how variable a thing tension was in cases of intraocular neoplasms.

Dr. ANDREW LITTLE (Bradford) said: By way of throwing light on the duration of those cases of leucosarcoma, I should like to mention a case of twenty-five years' duration. The case I examined a year ago, and found a white tumour involving the lower part of the ciliary body and anterior part of the choroid of the right eye. An iridectomy had been done on a previous occasion. On inquiry into the previous history of the case I found that the iridectomy had been done in the Royal Eye Hospital, Manchester, twenty-five years before, for sarcoma of the iris. The histological examination of the tumour proved the diagnosis of leucosarcoma to be the right one.

Dr. R. A. REEVE (Toronto) said: I should like to raise the point whether, in view of our knowledge, or want of knowledge, of the genesis and essence of sarcoma, we are not justified in regarding the sarcoma of the iris in the case just cited as really "cured," that of the ciliary body found twenty-five years later being really a separate occurrence. Thus, one removes a globe for sarcoma of choroid in a subject 50 years of age, and after a quiet interval of full fourteen years, sarcoma of the orbit occurs requiring exenteration. It would seem not irrational to regard the second growth as arising from a distinct focus with a much longer period of latency.

THE VISUAL ACUITY OF SCHOOL CHILDREN.

By W. B. INGLIS POLLOCK, M.D.Glasg.,
Pathologist, Glasgow Eye Infirmary; Ophthalmic Surgeon, Ayr County Hospital.

ALTHOUGH the general medical inspection of school children has only now become general throughout Great Britain as the result of the passing of the recent Education Acts, the examination of the visual acuity of school children has been carried out at various centres for a considerable number of years. In many instances these took the form of private researches by interested ophthalmic surgeons, and from their work the study of school hygiene sprung. The earliest of these investigations, it may be mentioned, was by James Ware, of London,[1] in 1813. The annual medical reports which have been issued recently by the educational authorities present great variations in the number of children with defective visual acuity. It is only necessary to cite one of these publications,[2] where the returns are made up from the individual reports of eleven medical officers, each having three schools to examine. The defective visual acuity for both eyes varies from 6·5 to 77.8 per cent. per school. The school board adds the following comment: "Unfortunately the returns as sent in are not uniform, and statistics regarding the vision would be misleading." My own investigation,[3] carried out some years ago in three of the same schools under this board, gave an average of 11.65 per cent. of defective vision. Another report[4] gives 49.9 per cent. of the urban scholars normal, and 50.1 per cent. defective. The following table has been compiled from the two latest reports[5] of the inspection of the pupils in the provided and non-provided schools of the London County Council:

London County Council Schools.

Year.	Total Scholars.	Returned Defective by Teacher.		Returned Defective by Oculist.		Cards Given.	
		No.	Per Cent.	No.	Per Cent.	No.	Per Cent.
To March, 1907	409,944	44,139	10.7	32,149	7.8	28,492	6.9
To March, 1908	473,145	50,854	10.75	35,142	7.43	29,504	6.24
To Dec., 1908...	313,415	29,326	9.36	20,584	6.58	17,314	5.52
Total ...	1,196,504	124,319	10.39	87,875	7.34	75,310	6.29

It will be seen that among 1,196,504 school children there is only 10.39 per cent. with defective vision after examination with Snellen's test types, carried out by their teachers. When those found defective were examined by the oculists, they discovered 7.34 per cent. with refractive errors, or a difference of 3 per cent., while to 6.29 per cent. cards were given advising their parents or guardians to seek medical treatment. With regard to the difference between teachers' and oculists' results, it is well known that the number of children with defective vision exceeds those with either refractive error or ocular disease. The 3 per cent. of extra children submitted to the oculists is, however, of advantage in giving to them the more complete examination. Various theories have been advanced to account for the difference, and they include shyness, want of cerebration in analysing the images formed upon the retina, anaemia, and immaturity of the retina.

The differences which have thus appeared in the published reports may be accounted for in the two following directions—the method of compiling statistics or the definition of defective vision. The results may be based upon the number of children or the number of eyes examined. In the former case they may be drawn from the binocular vision of the child, as in the London statistics; from the eye with better vision, as in my own statistics of the visual acuity; or from the vision of the worse eye of the child, as in the school with 77.8 per cent. On the other hand, the results may vary according to the definition of normal and defective vision. I have brought this subject forward to urge the desirability of uniformity of method and of definition in the comparatively simple but important subject of the visual acuity of school children.

In the first place, then, the results may vary according to the method of compiling the statistics. The view has been advocated of taking "the vision of the worse eye—the eyes being tested singly, because binocular vision tends towards the vision of the worse eye." My own experience has been that binocular vision is very often superior to the vision of the better eye.

This view is supported by the difference between my own statistics and those from the London schools when estimating from the better eye gave 11.65 per cent. and binocular vision 10.39 per cent. of children with defective vision. And how often do we find that the patient after the refraction of each eye has been separately corrected, can read an extra line of the test types when both eyes are open. Upon only one occasion do I recall a patient stating that his vision seemed weaker when both eyes were open and exact tests did not corroborate the statement. In fact I have never found binocular vision worse than the vision of the better eye. Had the method of basing statistics upon the vision of the poorer eye been for the detection of all abnormal conditions, one could have understood the position to a certain extent; but in that case the results should be analysed according to the number of eyes and not the number of children examined. It is, however, well known that the medical inspection of school children was founded with the view to the detection of those defects which interfere with the education of the scholars. It is undoubtedly of advantage that the parents or guardians of every child should be informed when defects are present; but as experience has shown that a large percentage do not act upon the information supplied to them through medical inspection, it seems useless to waste time and resources upon more than is required for educational purposes, except in serious cases.

My own results were based upon the vision of the better eye for the reason that it is not necessary for school purposes that children should have normal vision in both eyes, or even have binocular vision. It is also true that in most trades or occupations binocular vision is not required.[6] The method of employing binocular vision, or rather the vision when both eyes are open, is used by Dr. James Kerr[5] for the very good reason that such represents the ordinary condition of life. Both of the latter methods has the disadvantage of returning children with normal vision although one eye may be blind. It is, therefore, of importance that the vision of each eye should be tested singly, and every child with one or both eyes defective referred to the medical officers. Statistics may then be drawn up from the number of eyes examined, or preferably from the number of children referred. The latter course

would not be scientific, but it would indicate the numbers examined by the medical officers.

In the second place, variations may result from the standard of normal and defective vision adopted. My own conclusions were obtained by following the method used by Dr. Kerr[5] in the London schools since 1902. His earlier returns were classified in the following three groups: Vision normal ($\frac{6}{6}$), vision fair ($\frac{6}{9}$ to $\frac{6}{12}$), vision bad or defective ($\frac{6}{18}$ or less). The children with both eyes open are examined at a distance of 6 metres from the standard Snellen test types by their teachers. The denominator of the fraction representing the visual acuity (which ought not to be reduced) is then entered in a special column of the register opposite the name of the scholar. All "whose vision is $\frac{6}{18}$ or worse and children in Standard V and above whose vision is $\frac{6}{12}$ or worse" are put on a list and examined later by the medical officers. Such a method is thoroughly practical, although it may allow the higher degrees of hypermetropia to escape. These, as well as affections of the fundus, can be detected if every child is examined by means of the ophthalmoscope by a competent ophthalmologist within the year of entering school, four years later, and, finally, during the last year of school life.

Attention may here be directed to the theory which has been brought forward again of late, that the normal vision of the child is not equal to the normal vision of the adult, or rather that the average visual acuity of the child is not equal to the average visual acuity of the adult. Statistics in support of this theory ought not to be based upon the vision of the weaker eye of the child. To be of any value the results must be drawn from the number of eyes examined, and not from the number of individuals. It is also requisite that the investigation includes very large numbers, and it should only be carried out by those who have had a complete ophthalmic training. I have unfortunately not any comparative tables at present to lay before the meeting, but the following facts may be mentioned: It is not uncommon to find children with vision of $\frac{6}{5}$, but such visual acuity is comparatively rare for adults; while a vision of $\frac{6}{4}$ may be discovered occasionally among children, and it is almost unknown among adults.

In testing the vision of children below 6 years of age it is absolutely necessary that the test conform to their knowledge and intelligence. With children unversed in the alphabet it is useless to employ alphabetical tests. It is difficult to interest them in Snellen's test for illiterates. Much greater success will be gained with tests containing outline pictures of common objects In such cases it is not necessary that they recognize each object in every line; if two are named correctly that may be taken as sufficient evidence for the given line, since it is possible that the other objects in the same line are not known.

A curious error in association with this subject has appeared in an educational committee's medical report,[4] where it is stated that it is "impossible to estimate correctly the vision of infants unless they are examined in a dark room with accommodation temporarily suspended by the use of a mydriatic." What the writer probably refers to is the estimation of the refraction of the eyes in infants, because, with the high power of the accommodation at the ages of 4, 5 and 6, results obtained without the aid of a mydriatic are unreliable. It is not very difficult to encourage the children of these ages to attempt the test types.

They can be taken for examination in groups of three, and when one is naming the test objects the other two are placed so that, while having their companion under observation, they are unable to see the test types. It will then be found in most instances that the desire of emulation stimulates the others with a considerable degree of eagerness during examination.

Covering the eye with the palm of the hand on the same side is probably the simplest and quickest method of excluding one eye while testing the other. The fingers are not sufficient, as the child may peer between them, and if too firmly pressed upon the eyelids, the vision of the affected eye becomes disturbed for some time. Neither of these disadvantages occurs when the hollow of the palm is pressed ever the eye, with the ulnar border filling the bridge of the nose and the fingers lying upon the forehead. The trial frame is satisfactory when the child is closely overlooked, otherwise by rotating the head the test types can be seen with both eyes. The adjustment of the trial frame occupies a minute or two. The method with the palm of the hand allows the examiner to stand near the test types in order to point out the different objects while keeping the child under observation. It is well, of course, to have two or more sets of test types, so that by changing from one to the other no opportunities are given for remembering the order of the objects.

In conclusion it may be said that uniformity of method of examination and of definition of defective visual acuity is the only means of furnishing reliable statistics. The extraordinary variations which have been cited are bound to produce a bewilderment of the lay mind, if not a feeling of doubt as to the ability of the medical officers. It is scarcely possible under any system to persuade an intelligent educational committee that 77.8 per cent. of their scholars have defective vision. The average of 10.39 per cent. among the 1,196,504 scholars in the provided and non-provided schools of the London County Council during the last two years and nine months is as accurate a figure as can be obtained, and it has remained practically the same since 1902. Exaggeration will procure no advantage to any cause, and it will bring the whole system of the medical inspection of school children into discredit and contempt, when found in a division of the subject so easily comprehended and so much worked out as the examination of the visual acuity.

REFERENCES.

[1] James Ware: Observations Relative to the Near and Distant Sight of Different Persons, *Phil. Trans.*, London, 1813, vol. i, p. 31. [2] Digest of Reports of Medical Officers for the Year ended June, 1908, Govan Parish School Board. [3] W. B. Inglis Pollock: The Eyesight of School Children; being a Record of the Examination of over 3,000 School Children, *Trans. Glasg. Roy. Philos. Soc.*, 1906. [4] Lindsey County Council Education Committee, First Annual Report of the School Medical Officers, 1908. [5] London County Council, Report of the Education Committee Submitting the Report of the Medical Officer (Education) for the Year ended March 31st, 1908; and London County Council, Report of the Education Committee Submitting the Report of the Medical Officer (Education) for the Twenty-one Months ended December 31st, 1908. [6] Freeland Fergus: Eyesight in Relation to Compensation, British Medical Journal, December 29th, 1906.

DISCUSSION.

Mr. N. Bishop Harman (London) said that his large experience of school eye work in London led him to the conclusion that the recent edict of the Board of Education—that the vision of each eye of a child must be taken separately—caused a futile waste of time. They wanted to find out how much the child could see under ordinary conditions. Binocular testing was said to fail in discovering odd eyes; that he thought was an objection that did not mean much in practice. He had made comparative tests and found the alleged error of this mode of testing so small as to be negligible. He regretted Dr. Pollock had nothing to tell them of the eye conditions responsible for those defects in vision. Recently he had tabulated the results of the examination of the eyes of 1,100 London children, with results that were to be found in the *Proceedings of the Royal Society of Medicine*, Children's Section, April, 1909. It was worth noting that, of all the bad vision there shown, 43 per cent. was due to simple hypermetropia, 29 per cent. to hypermetropic astigmatism; both of those conditions were practically natural states. Of the rest, 7 per cent. had mixed astigmatism, 9 per cent. myopia, 10 per cent. myopic astigmatism, and 2 per cent. odd eyes; that was to say, if all those last four groups were taken as "myopia," then 25 per cent. of the defective vision was due to that cause. But, since those defective children represented barely one-tenth of the school children, the amount of myopia in the child population was no more than 2.5 per cent., and probably less, for their tests caught the myopes, but did not catch those hypermetropes who had good accommodation. Further, his returns demonstrated clearly how myopia increased, and what kind of eyes became myopic.

Dr. R. A. Reeve (Toronto) said he had been struck by the large number of cases applying for relief of asthenopia, due to hypermetropia or hypermetropic astigmatism at, say, 16 to 24 years of age, who had declared that they never had suffered from headache or other effect of eye-strain previously.

Reply.

Dr. Inglis Pollock, in reply, pointed out that defective vision remained practically at 10 per cent. throughout

school life, and the condition producing the defect differed at the different ages. In the earlier years it was mainly due to hypermetropia and the external conditions of the eyeball, but in the later years myopia played a much greater part. He had dealt with the question in his other papers. The fact that the inverted hypermetropic curve corresponded to the myopic curve was first pointed out by Professor Greeff, of Berlin, the guest of the Section. It was unfortunate that the children did not seek medical treatment, but the Representative Meeting had been considering the general question. The reason why Mr. Reeve did not find young children complaining of asthenopia was because the eyeballs were becoming myopic. He had, however, often seen children with asthenopia, both in private and in the clinic, but in these cases there was hypermetropic astigmatism as a rule.

DISCUSSION ON OPHTHALMIA NEONATORUM.*

OPENING PAPER.

By SYDNEY STEPHENSON, F.R.C.S.Edin.,
Ophthalmic Surgeon, Evelina Hospital for Children, Queen's Hospital for Children, and Queen Charlotte's Hospital.

IN introducing to your notice the report of the Committee on Ophthalmia Neonatorum (issued on May 8th last), and in inviting discussion thereon, I shall be extremely brief.

The Committee was of a responsible character, including, as it did, representatives of the various interests concerned, such as the gynaecologists, the obstetricians, the ophthalmologists, the bacteriologists, and the sanitarians. The interests of the medical profession at large were represented by the presence upon the Committee of the President, the Treasurer, the Chairman of the Council, and the Chairman of Representative Meetings of the British Medical Association. The co-operation of the Central Midwives Board was also invited, but unfortunately without success. The report of the Committee is now in your hands.

The Committee, recognizing that some of its recommendations are of a far-reaching nature on which there might be legitimate differences of opinion, resolved that the report should be referred for consideration to the Divisions of the British Medical Association. It also determined that the report should be discussed at this joint meeting of the Sections of Obstetrics and Ophthalmology. Any recommendations that may meet with the approval of the present joint meeting will, in due course, be submitted to the Ophthalmia Committee, with a view to their incorporation, if thought desirable, in an amended report.

At the same time I may remind my hearers that, according to the rules of the Association, while a Section or Sections may pass any resolution they think fit, yet such resolution or resolutions merely represent the expression of opinion of those present. As a matter of fact, a Section, as such, has no corporate authority in the Association. But it is the practice, so I am informed, for the Council of the Association to consider and to refer to the appropriate committees all resolutions which the honorary secretaries of Sections officially forward for that purpose.

DISCUSSION.

Dr. J. H. TAYLOR (Salford) said he hoped that nothing he might say would be regarded as any reflection on the excellent report on ophthalmia neonatorum, as he felt it would be sheer presumption on his part to criticize the work of men chosen for their eminence in this special department. He felt, however, that a general principle was involved which might have far-reaching consequences. He drew attention to the fact that while the Representative Meeting had only approved of pages 1 and 2 of the report with a few alterations, Mr. Stephenson now asked the meeting to approve also of page 3. Now, the third page contained some suggestions for treatment by medical men which ought not to be included in any report, as they tended to crystallize treatment, which ought to remain in a fluid condition. Fresh methods of treatment might soon be advised, and if the Association undertook to advise any special treatment now, it ought periodically to be revised by the Association, as new methods were devised. Further, for a great association specially to recommend any one line of treatment would be extremely dangerous for general practitioners. If a practitioner were brought up on a charge of malpraxis, and if it were proved that he either did not know or failed to carry out the treatment which had received the special sanction of the British Medical Association, that would be taken as presumptive evidence that the practitioner had not kept himself abreast of the best that was known. There would thus be serious danger in stamping with the authority of the Association any one line of treatment which might in a short time be superseded. If the whole report received the approval of the British Medical Association it would become the standard reference in courts of law, though other lines of treatment might be equally as good. The speaker therefore suggested that Mr. Stephenson should accept some addition to his resolution recommending the Council to add some words to the report which might act as a safeguard to general practitioners who did not follow out the suggestions of the report. If Mr. Stephenson would not accept this, he hoped the meeting would refuse to specially approve of the suggestions for treatment by medical men.

Mr. NIMMO WALKER (Liverpool) drew attention to the condemnation in the report of the use of Credé's method by midwives, as this method was still being taught to midwives' pupils by obstetricians. He agreed with the condemnation on the grounds that Credé's method, as now taught, not only was not absolute protection, but caused actual injury to the eyes by the use of too strong lotions, or even infection by contaminated lotions, as evidenced by cases which he had seen lately; he considered that the eyes should be "tabu" to the midwives. In regard to the recommendation of compulsory notification, while not opposing it, he asked whether its inclusion in the schedule of the Infectious Disease Act was workable, and pointed out that this Act applied to medical practitioners only. Notification could be made compulsory for midwives under the Midwives Act, 1902, by the order of the local health authority. In conclusion he emphasized the usefulness, as evidenced by his experience in St. Paul's Eye Hospital, Liverpool, of an ophthalmia department in eye hospitals, where cases of suspected infection could be taken on the day of birth for prophylactic measures, and cases of actual infection admitted with their mothers into a special ward.

Dr. WENDELL REBER (Philadelphia) said: There are two or three phases of this subject that appeal to one who has thought much on it. In the United States of America too much honour cannot be given to Dr. Lucien Howe, who, in season and out of season, for many years has campaigned against this dread disease, and who is responsible for most of the legislation relating to its control. Touching the matter of the professional relation, it is the feeling of the United States that the midwife should be allowed no liberty whatever in the use of Credé's method. Our own legislation does not permit the use of any prophylaxis other than the usual cleanliness imposed upon the midwife. A medical man must be summoned the moment any inflammatory signs whatever are noted. The feeling everywhere all over the States is that so fulminating a disease as ophthalmia neonatorum should be kept entirely under the control of the medical profession. Another point I wish to make is that better final results for the child will almost surely follow if arrangements can be made to have the mother nurse the child during the whole treatment. In the Philadelphia General Hospital arrangements were made some years since to admit both the mother and the child to the hospital at the same time, and excellent results have followed.

Dr. J. WHARTON (Manchester) said that a modified system of notification had been in vogue in Manchester for the last three years (1906 to the present), and as a result of a working arrangement between the Public Health Office and the Royal Eye Hospital, such notification had resulted in a marked reduction of the number of cases of

* Joint discussion of the Ophthalmological and Obstetric Sections.

ophthalmia neonatorum, amounting to about 40 per cent. In addition, not a single eye was lost, whereas previously the reverse was the case, in some instances amounting to 3 per cent.

Dr. Cecil Shaw (Belfast) supported the report as one sharing responsibility for it. He pointed out that the report made no attempt to crystallize treatment, as had been said, but merely made suggestions for a better routine method than Credé's. He agreed with Dr. Nimmo Walker's observations on the danger of Credé's method as applied by nurses, and urged the adoption of the report as pointing out a better way.

Dr. R. A. Reeve (Toronto) said: Might I suggest that, to meet the views of some opponents of this important resolution, the paragraph dealing with suggestions as to treatment be modified somewhat, especially since other lines of treatment than strict "Credé" have been found practically satisfactory?

Mr. Bishop Harman (London) said the report was excellent in its general features. But to get any real success in their efforts after legislation or the application of existing legislation, they must create a public feeling on the matter. Government officers and Ministers would not take any steps in advance of public demands; they had to be forced to work, for independent action only brought them into difficulties. They had been in some degree successful in awakening opinion. Only last year, at the International Congress of the Blind in Manchester, the subject came up for discussion, with the result that a committee of members of the different blind societies and colleges of the kingdom met, and with the help of two ophthalmic surgeons, drew up a report in simple yet instructive language the ordinary man might understand, and that without offence. Some of the men on this committee were county councillors, and they had exerted useful influence on their colleagues. By such means they could do much. On the matter of "definition," and the difficulty of notification, he thought that the original description of the disease by the Committee of the Ophthalmological Society made years ago was ample for all purposes. "If the child's eyes become red or swollen, or begin to run with matter. . . ." Nothing could be more explicit than that. All such cases should be notifiable. Then the local authorities' bacteriologist would examine films, and say whether the case was dangerous or not. In the work of the London County Council Blind Schools, where he had seen 600 children, he had perhaps the largest experience of any man in the country of these blinded children in after-years. His figures indicated that the disease was diminishing, but not so much as to warrant them in diminishing their efforts.

Dr. H. C. Mactier (Wolverhampton) proposed an amendment to page 3 of report, that immediately after the words "suggestions to medical practitioners" the following words be inserted:

> These are suggestions only, and not definite instructions for treatment.

Dr. R. C. Buist (Dundee) said: Notification is a social net which sweeps in fish other than those we want, but it is the only way of securing the capture of those we do want. All cases of ophthalmia are not gonorrhoeal, but we get hold of the gonorrhoeal cases by notifying all. In page 3 two general principles have dictated the recommendations. The first is the exclusion of routine treatment and the individualization of each case. The second is the restriction to the medical profession of every medical measure, such as an instillation into the eye, to the exclusion of the nurse or midwife.

MALFORMED CORNEA IN INHERITED SYPHILIS.

By Professor E. Fuchs,
Vienna.

[Abstract.]

Professor Fuchs, in a paper on malformation of the cornea in cases of inherited syphilis, paid tribute in the first place to the work of Sir Jonathan Hutchinson on the eye condition in congenital syphilis, and since the time of his writing scarcely anything had been added to our knowledge, so complete had been his observations and deductions. His own paper was a slight addition to the work previously described. He had noticed that in some cases of congenital syphilis the cornea was shaped as a vertical ellipse, while the normal cornea tended to have the shape of a horizontal ellipse, because the tissue of the limbus encroached upon the cornea above and below, but this was more apparent than real. In these cases of disease, however, the vertical ellipse was real, and not due to encroachment of the limbus. So far, he could not explain the malformation, nor had he enough material as yet to say with what frequency it was observed. In 28 cases noted it occurred 20 times in females, and it was noteworthy that interstitial keratitis was more frequent in females. Half the cases had interstitial keratitis, 5 chronic iritis, 1 congenital cataract, 2 corneal opacities, probably the result of strumous keratitis. The remaining six were old people with senile cataract. Excluding the last six old people—for in age the diagnosis of inherited syphilis was not readily made—he found that in the other 22 cases 8 showed definite inherited syphilis, 8 some indication of it, and 6 no symptom of it. During the year he had only seen about 50 cases of fresh interstitial keratitis, and only 8 of these had the ellipse, so that it was by no means common. He thought that the malformation might prove to be another of the signs of the inheritance of syphilis, although it must, like other signs, be taken with due regard to other conditions.

DISCUSSION.

Mr. Treacher Collins (London) asked if Professor Fuchs had examined any of these oval corneae anatomically, so as to eliminate the possibility of the ellipse being due to encroachment of the limbus.

Professor Fuchs replied that he had had as yet no opportunity for anatomical examination, but the vertical ellipse was a striking feature, and with it went marked irregular astigmatism, often to as much as 5 or 10 dioptres.

TREATMENT OF GLAUCOMA BY TREPHINING.

By Freeland Fergus, M.D.Glasg.,
Surgeon, Glasgow Eye Infirmary.

[Abstract.]

Dr. Fergus said that the operation which he had used had given him excellent results, and was essentially a mere modification of that of Lagrange. So far as that went he had no hesitation in saying that this modification stood or fell with that of Lagrange. From the clinical standpoint sclerectomy was perhaps as reliable as iridectomy, and certainly was more easily performed. It had some obvious advantages over iridectomy: (1) As it was all but painless, there was no need of a general anaesthetic. Many glaucoma patients were particularly bad subjects for general anaesthetics. There was often marked sclerosis of the vessels, and patients frequently had various circulatory troubles. In one case that he had seen the cardiac condition was so bad that he would have undertaken any operation requiring the administration of an anaesthetic with great reluctance, and it would have been impossible to have operated without one. (2) There was no danger of injuring the lens, a thing that was not unknown when a keratome was used. (3) The risk of septic infection was by this method reduced to a minimum, for the wound was at once covered by a large conjunctival flap; thus the underlying structures were effectively protected.

The operation was simplicity itself. A large conjunctival flap was dissected up to the sclero-corneal margin, just as for the operation of advancement. Then the trephine was used to remove a piece of sclera as near to the cornea as possible. The point of a fine iris repositor was next passed from the scleral opening right into the anterior chamber; lastly, the conjunctival flap was replaced, and stitched back into position.

DISCUSSION.

Dr. Andrew Little (Bradford) said he would like to point out, in connexion with this operation of trephining

the sclera for glaucoma, that there was a danger of septic infection of the eye as a late symptom. He had had to remove eyes for general infection of the eyeball years after what were admitted to be cases of successful filtration cicatrices.

Dr. BERRY (Edinburgh) considered that Dr. Fergus's operation might be useful in forming a cystoid cicatrix. The operation was obviously not called for in cases in which iridectomy was at all likely to be successful.

Mr. TREACHER COLLINS (London) said that in the operation described by Dr. Freeland Fergus he did two things: (1) The removal of a piece of the sclera by trephining; and (2) the breaking through the ligamentum pectinatum with a spatula—that is, a cyclodialysis. In estimating the value of the operation it was important to recognize these two different factors, because one aimed at the relief of tension by the formation of a cystoid scar, and the production of an artificial channel for the exit of fluid from the eye; the other aimed at the opening of the normal passage of exit through the ligamentum pectinatum.

Mr. JOHNSON TAYLOR (Norwich) asked (1) whether Dr. Freeland Fergus ever found it necessary to remove a part of the iris; (2) whether he would do his trephining operation in blind, painful glaucoma cases in which probably most ophthalmic surgeons would excise the eye.

Professor E. FUCHS (Vienna) said he had tried trephining but further away from the cornea. He found only temporary relief from the operation. He had also tried cyclodialysis in several cases, but he had recently given it up as he had found the symptoms recurred, and pathological examination had shown that in the places where the cyclodialysis was performed the tissues were more cicatrized, and that no permanent communication between the anterior chamber and the perichoroidal space had been obtained. He still placed his reliance in the first place on the old operation of iridectomy.

Dr. FREELAND FERGUS, in reply, said that as regards the preparation of the eye he used nothing but washing with sterilized normal saline. A few days of such treatment had been found to put the matter right. It was important to pass about a pint of the fluid through the conjunctival sac every four or six hours, and the fluid should have a fall of about 18 in. As regards the time that had elapsed since the first operation Dr. Fergus wished to point out that his operation was only a modification of that of Lagrange; it was merely an easier and more convenient way of performing that operation. If Lagrange's operation was bad, so was his; if Lagrange's operation was good, his was only a simpler manner of performing it. The important point in operating was so far as possible to make sure of the asepticity of the parts by careful bacteriological investigation. That was a plan he had adopted during the last twelve or fifteen years, and, as showing the benefit of it, he might say that of the last 710 cases done by him in the hospital, not one had been lost by panophthalmitis. As regards the remarks made by Mr. Treacher Collins that it was trephining along with cyclodialysis, he might say that in 3 cases he had contented himself with simple trephining. The operation was a much easier one than iridectomy, and if it should prove equally successful, then it should be adopted.

THE SERUM DIAGNOSIS OF SYPHILIS.

By ALEXANDER FLEMING, F.R.C.S.Eng.,
Assistant in the Therapeutic Inoculation Department, St. Mary's Hospital.

THE method which I am about to demonstrate for the serum diagnosis of syphilis differs very much from the Wassermann's original adaptation of the Bordet-Gengou method. Wassermann used a saline extract of the liver of a syphilitic fetus, serum from a rabbit which had been immunized to sheep's red corpuscles, and fresh guinea-pig serum. Very soon, however, the French observers, and especially Levaditi, demonstrated that the test would come off when one used saline extracts of normal liver and other organs. Then the Viennese school, headed by Landsteiner, showed that alcoholic extracts of these various organs would serve for the test. This may seem at first sight as a very small point, but in practice it was an enormous advance owing to the very uncertain character of the saline extracts and the difficulty one had in keeping them free from contaminating organisms. This was soon followed by the discovery that some lipoid substances such as lecithin, and even simpler substances such as oleate or glycocholate of soda, would serve. In practice I find an alcoholic extract of heart to be very suitable for the test, and it does not seem very material from which source the heart is obtained—human, sheep, rabbits, or guinea-pigs being all useful.

Next the various observers set themselves to simplify the other steps of the test. Bauer did away with the immunized rabbit, and made use of the natural haemolytic power of human serum for sheep corpuscles. Hecht went further and used the complement as well as the haemolytic amboceptor which is present in fresh human serum, and the test I am about to show you is an adaptation of Hecht's method for use with very small quantities of serum, as in most cases it is impracticable, in England, at any rate, to draw off the much larger quantities which are necessary for the performance of the test as described by the Continental authorities. Especially is this so in connexion with ophthalmology, where one deals largely with children suffering from congenital syphilis. For the performance of the test the following substances are required:

1. An extract of heart muscle made by grinding up 1 part of heart with 5 parts of alcohol and extracting for one hour at 60° C. This can be kept in stock and diluted to 5 or 10 per cent. (according to its strength) before use.
2. Sheep's corpuscles washed and made up to 10 per cent. in normal saline.
3. Serum to be tested in an ordinary blood capsule such as is used for a Widal's test or an opsonic index.

A pipette is taken such as is used for the opsonic estimations and a mark is made about ½ in. from the end of the capillary with an aniline pencil. Another mark is made higher up the stem corresponding to about four times the volume marked off by the lower mark. (The exact volumes are immaterial, but if one is doing large numbers of the tests it is convenient to have two pipettes, one with a volume marked off corresponding to 10 c.mm. and another with 40 c.mm. marked off.) These latter volumes I find convenient as one can always get from an ordinary blood capsule two volumes of serum of 10 c.mm., without having to take the trouble to centrifuge the blood to separate the serum.

The following mixtures are now made:

1. Extract 4 vols., syphilitic serum 1 vol.
2. Normal saline 4 vols., syphilitic serum 1 vol.
3. Extract 4 vols., normal serum 1 vol.
4. Normal saline 4 vols., normal serum 1 vol.
5. Extract 4 vols.

These are incubated for one hour at 37° C., then 10 c.mm. (1 vol.) of 10 per cent. sheep's corpuscles are added to each of the tubes and the incubation continued for another hour.

The results one obtains are:—No haemolysis in tubes 1 and 5; haemolysis in tubes 2, 3 and 4.

The results which I have obtained with this method are as good as by the more complicated procedures, and, taking all syphilitics indiscriminately, a positive result can be obtained in almost every case, while out of a very large series of controls only a very small percentage failed to give a negative reaction, and of those supposedly non-syphilitic controls who gave positive reactions the majority, on being questioned closely, gave histories so suspicious as almost to warrant the conclusion that they had suffered from syphilis.

The test comes off quite as well with congenital syphilis as it does in acquired cases. Most of the congenital cases I have tried have been from the Eye Department of St. Mary's Hospital, and I am much indebted to Mr. Paton for the kind way in which he has placed the material at my disposal. Out of a number of cases of typical interstitial keratitis the test has been positive in every case, and the same applies to the cases of choroiditis which I have tested. Of course, there were one or two cases where the clinical diagnosis was not certain and where the test was used to help in the diagnosis, but these I have left out of the reckoning, whether the result was positive or negative.

As regards conditions other than eye affections, primary cases have been found by many not to be certain in their results, but of the primary cases I have tested only one failed to give the test, that being the first one I tried. I have not been able to trace this patient, but it is conceivable that the chancre which he showed was not a

syphilitic one. All the secondary cases I have tried have yielded positive results, and practically all the tertiaries. The parasyphilitic conditions, as instanced by tabes and general paralysis, vary somewhat in their results, for whereas general paralytics give positive results in almost every case, the tabetics do not give it in more than about 60 per cent., and I have noticed that in most of those who failed to give the reaction all history of syphilis was strongly denied.

Treatment, when efficiently carried out, modifies the reaction, so that cases, when they have been vigorously treated for a long period, fail to show it, and from what I have seen I have come to the conclusion that when a case is cured the reaction disappears. If time proves that this conclusion is warranted, then the value of the reaction is greatly enhanced, as it would be possible, by testing at intervals, to lessen the duration of the treatment in many cases; and in others, where the test remained positive, it would indicate that further treatment was necessary to avoid the troublesome recurrences of the affection which often take place, even after a full course of treatment with mercury.

THE DIAPHRAGM TEST FOR BINOCULAR VISION AND ITS DISORDERS.

By N. Bishop Harman, M.A., M.B.Cantab., F.R.C.S.Eng.

This test is one of rare simplicity, and yet one that will elicit a surprising amount of information when applied to practice. It is simple because it rests upon a phenomenon that is of everyday occurrence. On looking out of a window

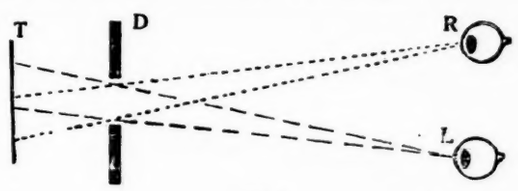


Fig. 1.

the man who has natural binocular vision sees more widely than does the man who has but one eye, or who sees with but one eye at a time. With this test the patient looks through a hole in a screen (D, Fig. 1) at the test card (T). The paths of the vision are shown in Fig. 1, and the

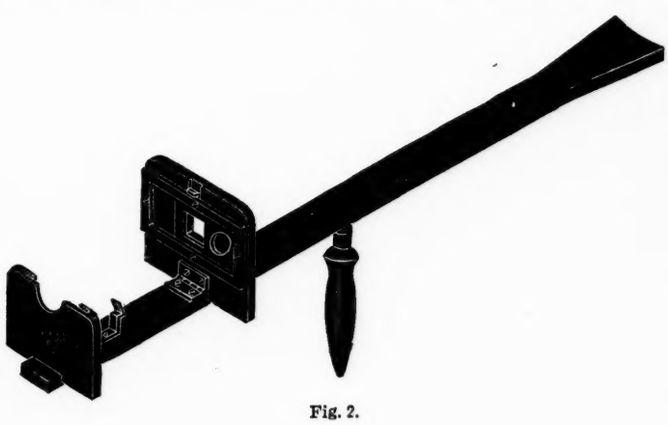


Fig. 2.

manner in which right and left monocular and also binocular vision is arranged for. The form of the instrument is shown in Fig. 2. The appearance of a test card for reading is seen in Fig. 3; the dotted lines on the print enclose the band of print seen by both eyes, and the lateral portions are seen by each eye singly by crossed vision.

The test cards are of great diversity. Print of any size, from diamond in set paragraphs to canon in paired capitals; black or coloured squares, variously disposed; pictures for children.

The test is of value for the following purposes:

1. To determine the equality of visual acuity in the two eyes.
2. To determine the presence, the absence, or a defect of binocular vision.
3. To exercise the vision in squinting eyes.
4. To detect malingerers feigning monocular blindness.
5. To demonstrate certain physiological phenomena.

A large selection of Screens in Chippendale. Sheraton, Louis XV. and XVI. and other styles, also Lattice Screens, Japanese Screens, Cheval and Wing Screens. An example of value, the Four-Fold

Fig. 3.

Take, for example, latent squint. The phenomena produced by the various orders can be best shown by the use of the test card with a single line of letters or figures:

123456789.

The man with good binocular vision reads 1234 with the right eye, 6789 with the left, and 5 with both eyes.

In convergence (esophoria) the middle letters are overlapped and are suppressed, so that the man reads something like this:

126789.

In divergence (exophoria) the middle letter is reduplicated, and the man reads:

12345 56789.

In vertical displacement (hyperphoria) the parts of the line of letters seen by each eye are on different lines or levels, thus:

12345

56789.

All these phenomena can be seen by the surgeon himself when an excessive prism is placed before one eye, or by simply displacing one eye by the push of the finger.

Again: A malingerer can hardly escape detection by the use of this test. Answers by the mouth are not necessary, for the surgeon, watching the man's eyes, will see *the co-ordinate movements of the eyes as the man looks from one to other area of crossed vision.* The movement is proof of two-eyed vision; the man with only one sighted eye does not make it.

Mr. Harman said that in recent experiments with the instrument he had found that by varying the size of the hole in the screen it was possible to estimate numerically the value of the desire for perfect binocular vision, or what is known as the "fusion faculty."

The instrument is made in suitable materials in excellent fashion by Messrs. George Culver, Limited, of White Lion Street, London, N. It costs only a few shillings.

DISCUSSION.

Dr. W. B. Inglis Pollock (Glasgow) said he found this instrument always useful after prescribing reading glasses. It took only a minute to read the line of figures, and this informed the surgeon whether the patient was using both eyes.

Professor Fuchs (Vienna) said he thought the test exceedingly simple and of great value.

A SECTOMAGRAPH WITH BINOCULAR FIXATION.

By J. H. Tomlinson, M.R.C.S., L.R.C.P.,
Clinical Assistant, Royal Westminster Ophthalmic Hospital.

This instrument can be used for general perimetry or for accurately mapping out blind or anaesthetic areas. The test object used to prove the sensitiveness of the retina is

a second image of the spot used as the fixation point. This second image is obtained by reflection from a mirror hinged within a cone, the angle of the mirror determining the angular position of the second image on the retina. The cone can be rotated round its axis so that the second image is caused to make a circular excursion on the retina; in this way Bjerrum's method of investigation can be employed. An automatic registration is obtained by means of a needle which is carried by the mirror and extruded pneumatically by mechanism similar to that used for operating a photographic shutter. The second eye looks down a tube at a small spot the same size as the spot looked at by the eye under examination; the brain interprets this as the same spot, and stereoscopic fixation is thus obtained.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A CASE OF GUNSHOT WOUND.

A MILITIAMAN, aged 21, was admitted to the Lockhart Hospital on June 19th, who, a few hours previously, had been accidentally shot in the back during manœuvres by a man some 5 to 10 yards behind him. At the time of the accident the patient felt as though he had been struck from behind, but did not fall, and even wished to walk over to the camp immediately afterwards. He experienced comparatively little shock, and on admission to hospital was not suffering much inconvenience. The temperature was 99°, and the pulse 80. The skin wound, a vertical slit with seared edges, was situated ½ in. to the left of the middle line at the level of the eleventh dorsal vertebra.

The *x* rays were not available, so under chloroform an incision 3 in. long was made downwards and outwards from the wound, this being the direction of maximum tenderness. Nothing was discovered on superficial dissection, but a slight gap in the fibres of the lumbar fascia close to the original wound led one to introduce a probe, which passed obliquely outwards and revealed the bullet deeply imbedded in the erector spinae muscle 2½ in. from the point of entrance. It was easily removed with forceps, the incision was stitched, the wound drained and recovery was uneventful.

Fig. 1.

The accompanying photographs will serve to illustrate the main facts of the case.

Fig. 1 represents the bullet, of regulation Lee-Enfield pattern, as it appeared just after removal. The missile had carried along with it a small piece of the man's shirt, and this, as the photograph well shows was matted with blood and closely adherent to its base at one side, where the cupro-nickel coating had burst slightly. The hole in the shirt where the part was torn away is shown in Fig. 2. The two projecting fibres to the left as well as the inner surface of the garment were bloodstained. Examination of the tunic through which the bullet first passed revealed only a small horizontal tear close to one of the seams.

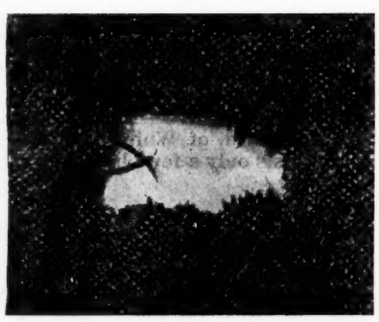


Fig. 2.

The most noteworthy point in the case is the comparatively slight injury in a gunshot wound inflicted by a military rifle at close quarters. The distances given me by several eyewitnesses varied from 5 to 10 yards, and, according to one, was "certainly not more than 15 yards." How a modern bullet having a muzzle velocity of over 2,000 ft. per second could merely inflict a flesh wound at a few yards' range is somewhat difficult of explanation. It had encountered no hard object—belt, button, etc.—in its course, nor had it struck bone on penetrating the body.

Lanark. DOUGLAS J. GUTHRIE, M.B., Ch.B.

TICK FEVER IN NYASALAND.

MY object in writing this note is to draw attention to the extremely wide range of distribution of tick fever in Nyasaland. At one time presumed to be confined more or less to the country to the south-west of Lake Nyasa, cases of spirochaetosis have now been met with over quite three-fourths of the Protectorate, the most highly infected areas being the districts bordering the lake. The disease appears to decline in incidence as one approaches the southern end of the Protectorate—that is to say, in the districts furthest away from the lake.

This precise knowledge of the distribution of tick fever has been obtained by medical officers at present engaged on sleeping-sickness investigations in the lake districts, which hitherto have been a *terra incognita* from the medical standpoint. In a native prison in one of these districts the floor, walls, and ceiling of the building were found to be teeming with *Ornithodoros moubata*, although none of the inmates of the prison complained of any febrile indisposition. The Indian hospital assistant, however, who was engaged on sleeping-sickness duty, but who happened, incidentally, to visit the prison, was shortly after laid up with what proved on blood examination to be a heavy spirochaete infection. This circumstance alone would establish the proof, if proof were necessary, that natives residing in localities infested with *O. moubata* must be more or less immune to the infection.

That this immunity is by no means general is evidenced by the frequent references in the medical officers' reports to the large number of natives constantly met with who in the course of routine blood examinations are found to harbour the parasite. One of the medical officers has observed that the clinical symptoms in heavy infections are often found to be less severe than in those cases where the organisms are scanty.

Before bringing this note to a close I should like to say one word regarding an affection which a few years ago—before the pathogenicity of *O. moubata* was recognized in this country—used to be called "Tanganyika blindness." It occasionally happened that a European came under treatment for a complaint which went by this name. There was a history in these cases of recurrent attacks of what was presumed to be malarial fever, and the eye condition was accordingly regarded as a malarial iritis. In the light of our present knowledge, however, there is little reason to doubt that a spirochaete infection was the cause of the iritis in these cases, and the name which this so-called "blindness" bore would indicate that tick fever must be prevalent on Lake Tanganyika also.

H. HEARSEY,
Zomba, Nyasaland. Principal Medical Officer, Nyasaland.

DR. FREDERICK A. COOK, whose name has recently been in all men's mouths in connexion with the alleged discovery of the North Pole, was (says the *Journal of the American Medical Association*) born in Sullivan County, New York, on June 10th, 1865. After attending public schools in Brooklyn and graduating from the University of the City of New York, he took his medical course at the College of Physicians and Surgeons of Columbia University, New York, and practised in Brooklyn for a brief period. His interest early turned to scientific exploration, and he became surgeon of the Peary Expedition in 1891. Since then his time has been devoted largely to exploration work. He was surgeon of the Belgian Antarctic Expedition, in which he conducted himself so well that he was awarded medals by the Royal Society of Belgium and the Royal Geographical Society of Belgium, and was decorated with the Order of Leopold by the King of the Belgians. Another exploit was the ascent of Mount McKinley in Alaska, in which he was the pioneer, in 1906. In a work entitled *Through the First Antarctic Night*, he described his trip with the Belgian Expedition; in another, bearing the title *To the Top of Mount McKinley*, he gave an account of his ascent of that mountain.

Reviews.

GENERAL MEDICINE.

In our review of the first volume of *Ergebnisse der Inneren Medizin und Kinderheilkunde*[1] (British Medical Journal, vol. ii, 1908, p. 504) the objects of this great undertaking were fully described, and we have now to record the appearance of a second volume wherein a series of critical analyses is presented of many of the most prominent clinical and pathological problems of the day. Fifteen articles are included in the series, all of them from the pens of writers well qualified for the task, and from each paper the reader will be able to extract the latest modern information as distilled from the many hundreds of references that are quoted. Foremost amongst them is placed an analytical account of recent research on the subject of trypanosomiasis in human beings, by Dr. Martin Meyer of Hamburg, who traces the various steps which have led to the present views on the subject. The value of preventive measures and the complete failure of curative efforts are fully recognized, and a useful list of drugs that have been found to be useless—86 in number—is appended. Purulent affections of the urinary tract in infants are next considered, and as the subject is but lightly touched upon in most of the English textbooks, the article is of more than common interest. The etiology and causation have not been fully made out, but the disease may properly be described as a pyelo-cystitis occurring in infants under 2 years of age, and mostly among female babies of the lower class. It has proved amenable to treatment by salol and urotropin with careful dieting. This article is by Dr. Göppert of Kattowitz, in Silesia, where the disease appears to have been seen frequently. A long account of the treatment of diabetes mellitus, by Dr. W. Falta of Vienna, deals with a very large number of references, and the main object of the paper is to indicate the broad lines of connexion between the pathology of the disease as at present known, or conjectured, and its treatment. In this, as in some other of the more voluminous contributions, it is to be desired that only a concise account were given of those observations which are of doubtful value. Many of the contributors, doubtless with a laudable desire to do justice to those whom they quote, have rather overloaded their articles with unnecessary detail. This cannot be said, however, of an admirable account of primary intestinal tuberculosis, by Dr. Edens of Munich. A large amount of information is conveyed in but little space, and the article contains some very suggestive remarks as to the way in which a primary infection may bring about increased susceptibility. The arthritic diathesis in childhood is discussed by Drs. Méry and E. Terrien, of Paris, in an analysis of fifteen recent papers, mainly by French writers. A very elaborate study of the chemico-biological aspects of malignant growths by Dr. Carl Lewin, of Berlin, carries the subject a step forward into the dark, but no indication is given of any glimmer of light in the future. Many of the difficult problems, physiological and pathological, in the study of children and their diseases are in like manner inquired into, and a series of *x*-ray photographs of different morbid conditions at the end of the volume are of especial interest as showing the ranges of shadow that may be cast in health as well as in disease. Space will not admit of individual reference to each paper, and it must suffice to record that the whole work is carried out in the same thorough manner as it was begun, and although it errs occasionally on the side of prolixity, it cannot fail to be of immense service to all who may be pursuing investigations on any of the matters dealt with, and who may wish to ascertain at little trouble to themselves the opinion of previous workers in the same field.

The first volume of the book by Professor De-Giovanni, of Padua, the Italian edition of which was reviewed some five years ago (British Medical Journal, 1904, vol. ii, p. 1015), now appears in an English translation by Dr. J. J. Eyre, under the title *Clinical Commentaries deduced from the Morphology of the Human Body*.[2] The translation has been made from the second Italian edition, and the volume will be found an interesting and instructive attempt to show that the methods of morphology are of the utmost use in clinical observations, and that, as a matter of fact, no proper conception can be gained of any individual's tendencies towards diseased conditions, unless his general and special morphological characteristics are carefully inquired into and thoroughly understood. In other words, Professor De-Giovanni believes that every individual possesses special characteristic bodily conditions, which differentiate him more or less from his fellows, whilst at the same time they make him more or less liable to pass into certain conditions of disease; or, to quote the Professor, "the cause of a special morbidity resides in the special morphology of the organism," from which it follows that many morbid phenomena are the expressions of two factors—the action of the cause and the reaction of the substratum—and it becomes obvious that, granted the correctness of the contentions, the object of preventive medicine should be to recognize, as soon as possible, in the life-history of an individual his special morphological characteristics, and then lay down the rules which must be observed in order to nullify special morbid tendencies. But, although Professor De-Giovanni lays great stress upon individuality and the consequent tendency to special morbidity, he fully admits that individuals may be grouped, for many practical clinical purposes, into classes, and the means he adopts for the recognition of special and general morphological characteristics are relative measurements, of which the most important are the stature, the stretch or greatest distance between the tips of the fingers when the arms are at right angles to the body, the thoracic circumference, the sternal length, the abdominal length, and the relative proportions of its xipho-umbilical and umbilico-pubic sections, the bi-iliac length, and the size of the heart. When the above measurements have certain definite relations to each other they indicate, according to Professor De-Giovanni, morphologic combinations, and point to more or less definite tendencies to morbidity. These great morphological combinations, which are subject to many variations, are described and discussed. The book is interesting and suggestive, but the essential facts it contains might have been compressed into a smaller number of words.

NEUROLOGY.

The great progress in the study of diseases of the nervous system that has been made in recent years is well brought out in the new textbook of nervous diseases,[3] edited by Dr. H. Curschmann, of Mainz. The first 68 pages, by Dr. S. Schönborn, deal with the general diagnosis of nervous diseases; disorders of the peripheral nerves are discussed by Dr. H. Steinert; and the normal and pathological physiology of the spinal cord by Dr. M. Rothmann. Tabes dorsalis and Friedreich's ataxia are described by Dr. Schönborn, who dismisses in but a few words the important subject of deep anaesthesia in tabes, so well put forward by Grasset of Montpellier in his recent monograph (*Le Tabes, maladie de la sensibilité profonde.* Par le Dr. J. Grasset, British Medical Journal, 1909, vol. i, p. 903.) Dr. Fr. Jamin contributes 50 pages on various paralyses and atrophies due to inflammations of the cord and bulb. Syringomyelia, appropriately enough, is treated by Dr. Schlesinger, as are disseminate sclerosis and haematomyelia, in three excellent articles. Traumatic affections and tumours of the cord are described by Dr. Finkelnburg, while a comprehensive account of the affections of the conus terminalis and cauda equina is contributed by Dr. L. R. Müller. Some twenty pages are given to the muscular atrophies in which no changes in the central nervous system have been found, and this section is by the editor; it is well illustrated by photographs, but does not exhibit a very extensive acquaintance with the literature of myasthenia gravis, for example, for no reference is made to the work of the Italian or

[1] *Ergebnisse der Inneren Medizin und Kinderheilkunde.* Contributed by F. Kraus, O. Minkowski, Fr. Müller, H. Sahli, A. Czerny, O. Heubner; and edited by Th. Brugsch and Langstein of Berlin, Eric Meyer of Munich, and A. Schittenhelm of Erlangen. Second volume, with name and subject indices to first and second volumes. Berlin: J. Springer. 1908. (Sup. roy. 8vo, pp. 708; Taf. vi. M.24.)

[2] *Clinical Commentaries deduced from the Morphology of the Human Body.* By Professor A. De-Giovanni. Translated from second Italian edition by J. J. Eyre. London: Rebman, Limited. 1909. (Med. 8vo, pp. 448, figs. 11. 15s.)

[3] *Lehrbuch der Nervenkrankheiten.* Herausgegeben von H. Curschmann. Berlin: J. Springer. 1909. (Sup. roy. 8vo, pp. 987; 289 illustrations. M.24.)

English investigators who have done not a little to clear up the pathology of this interesting but rare disorder. The normal and pathological anatomy of the brain are detailed in 100 pages by Dr. H. Liepmann, who gives lucid accounts of the difficult subjects of aphasia or apraxia; the varieties of meningitis are described by Dr. H. Starck, tumours and inflammations of the brain by Dr. M. Lewandowsky, disturbances of the cerebral circulation by Dr. C. Hirsch, general paralysis of the insane and epilepsy by Dr. R. Gaupp; there are, it appears, 35,000 epileptics in Germany. The organic nervous disorders of infancy are discussed by Dr. J. Ibrahim; a chapter on "Hyperkinetic Diseases," from the pen of Dr. Fr. Pineles, deals with a heterogeneous collection of eleven maladies, beginning with chorea and ending with Menière's disease. Hysteria and other psychasthenias are well described by Dr. G. Aschaffenburg, and the little that is known about affections of the sympathetic nervous system is set out by Dr. L. Müller. Vasomotor and trophic diseases, among which are included intermittent claudication, myxoedema, and Graves's disease, are treated of by the editor, who betrays no great knowledge of the literature dealing with the first of these three disorders, and in consequence is not seen at his best when describing it. Dr. F. Quensel contributes a chapter on the toxic diseases of the nervous system; the last chapter, by Professor F. Krause, gives an account of the operative treatment of nervous disorders. As is inevitable in a large textbook to which many writers have contributed, a certain unevenness of style and treatment is apparent in this textbook of nervous diseases, but much of it is first-rate. It is handsomely got up, well printed, and well illustrated; the names of authors quoted are given, but room has not been found in it for references to the literature. It is up to date, and may be taken as an authoritative exposition of the views and methods of the best-known German neurologists, taking for the most part but scant notice of the work done and the opinions held by the neurologists of other countries. With this qualification it may be warmly recommended to the attention of all who are interested in nervous disorders.

Dr. EMIL VILLIGER'S introduction to the preparation and study of the brain[4] is a brief summary of the methods best adapted to display the main macroscopical features of cerebral anatomy and an enumeration of the structures which can be rendered evident by the means suggested. The methods do not differ very essentially from those adopted in the majority of the dissecting-rooms in this country, except that Dr. Villiger wisely lays stress on the fact that it is not possible to display properly all the main features of the anatomy of the brain on a single specimen, and he advises that two specimens at least should be used. He also draws attention to the necessity of leaving the membranes undisturbed on the specimen which is to be utilized for the study of the velum interpositum and the vela choroidea inferior. The instructions given are quite clear but they are scarcely full enough to enable a junior student to locate all the parts mentioned, and there are no diagrams or illustrations.

Dr. CRITCHLEY'S *Atlas of the Muscular System*[5] consists of eight plates, in which many of the muscles of the human subject, the skeleton, and diagrammatic representations of some of the peripheral nerves are more or less clearly depicted by means of the collotype process. The plates are accompanied by short descriptive accounts of the general characters and the attachments of the muscles. In the absence of preface or introduction it is difficult to discover the object of the atlas. It is certainly too incomplete and not sufficiently definite to be of much use to medical students. It might have been thought that it was intended for the use of artists were it not that the surface contours are not shown, and that two out of the eight plates are devoted to some of the special deeper muscles of the upper and lower limbs. The object of the atlas must therefore remain doubtful, but it may be said that the representations of the more superficial muscles as seen from the front, the back, and the side, are sufficiently correct, though the figures are not vigorous or striking. The latter facts may possibly be due to the process of reproduction which has been adopted.

Dr. HERMANN DURCK'S researches on the Pathologica Anatomy of Beri-Beri[6] form a most useful contribution to the study of the histology of the peripheral nervous system in health and disease. He considers that the most important result arising from his minute examinations of 11 cases of beri-beri is that the new-formed tissue associated with the degenerative process is not connective tissue, as is usually maintained, but nervous tissue which has lost its differential characteristics. It has a fibrous structure and possesses elongated, oval nuclei, but the resemblance to connective tissue is purely superficial and highly misleading.

> The tissue so arising never was connective tissue; its mode of development is not that of connective tissue, and it never will become connective tissue; it remains even for protracted periods, perhaps until the death of the individual and as long as the noxa damaging the specific characters of the nerve fibres persists, as latent nerve tissue—neuroplasma with neuroblasts.

This tissue, the author holds, retains the capacity to recreate the nerve, but in beri-beri does not usually exercise this capacity owing to the fact that the toxic substance, which has a specifically destructive influence on nervous tissue, continues to operate, and prevents the formation of the medulla and the primitive fibrils of the axis cylinder. The morphological processes of degeneration found in the peripheral nerves in cases of beri-beri polyneuritis resemble those found in many other affections which attack the peripheral nervous apparatus, and Dr. Dürck considers that they afford strong support for the neuroblast theory of the peripheral nervous system, though he recognizes that the central cell of the neuron must exercise a "trophic or regulating" influence in order that the chain of neuroblasts may rebuild the requisite conductive material (sheath and neuraxon). In nine of his cases the author examined the spinal cord, in which he invariably found lesions. The changes observed varied in intensity from slight alterations in the minute structure of the ganglion cells to complete symmetrical sclerosis of the two posterior columns of Goll and Burdach. Special praise must be given to the abundant and most excellent illustrations, each of which is separately mounted on black paper; this plan adds to the artistic effect and also makes it easy to place side by side on the same page drawings requiring the use of different sets of colours or reproduced by different processes. The coloured drawings of the artist, Herr Dirr, are marvellously good, and on examining their delicacy and minuteness of detail we can well understand that they involved eighteen months' work. The firm of Werner and Winter, which undertook the lithography, is also to be congratulated on the excellence of its reproductions.

ELECTRICITY IN MEDICINE.

THE electro-pathological collection in the museum of the University Institute for Forensic Medicine in Vienna has been reproduced for the benefit of the world at large in the form of an *Atlas*,[7] of which Dr. S. JELLINEK, the well-known authority on this subject, is the compiler. It is no detriment to the value of the German text to say that the outstanding feature of this tome is the extraordinary success of the coloured plates—the result, we believe, of the four-colour printing process. The plates illustrate in marvellous detail the changes which take place in the tissues under the influence of the electrical current. Dr. Jellinek's method of setting to work may be commended to other atlas makers. He takes about thirty typical cases of electrical injuries, including one case of deliberate self-mutilation, briefly describes the circumstances of each, and then discusses it separately in its clinical, forensic,

[4] *Anleitung zur Präparation und zum Studium der Anatomie des Gehirns.* Von Dr. Med. Emil Villiger. Leipzig: W. Engelmann. 1909. (Royal 8vo, pp. 23. M. 1.)

[5] *An Atlas of the Muscular System with Anatomical Description.* By H. G. Critchley, M A, M.D. London: Allman and Son. (Imp. 4to; eight plates. 5s.)

[6] *Untersuchungen über die pathologische Anatomie der Beri-Beri.* Von Professor Dr. Hermann Dürck. Achtes Supplement der *Beiträge zur pathologischen Anatomie und zur allgemeinen Pathologie.* Herausgegeben von L. Aschoff und F. Marchand. Jena: Gustav Fischer. 1908. (Sup. roy. 8vo, pp. 190; with numerons illustrations, many in colours. M.25.)

[7] *Atlas der Elektropathologie.* Von Dr. S. Jellinek. Berlin and Vienna: Urban and Schwarzenberg. 1909. (Demy 4to, pp. 103; 230 engravings on 96 plates, and 16 figures in text. M.35 = K.42.)

and electro-technical bearings. These three points of view cannot, of course, always be divided in the clear-cut manner in which Dr. Jellinek divides them in his synopses, but nevertheless the plan is useful. A large proportion of the accidents which occur seem to be due to the disregard of elementary precautions on the part of the victims. Electricians and persons in their employment who have sustained accidents while repairing wires or cleaning machinery, form the majority of the cases, but injuries to laymen, due to defective installations and other causes, are perhaps of even greater public importance. The additional precautions which the author recommends in a given set of circumstances should be studied by the electrical engineer. From the medical point of view, some of the cases are unexpectedly complicated. Dr. Jellinek describes how a lad, a butcher's assistant, startled by a peremptory order, brought his head into contact with an insufficiently protected switch. Although the pressure was only 200 volts, he received fatal injuries. He was wearing wooden shoes and no stockings, and was standing on a damp stone floor. There was no doubt that the current passed through his body, but the only external sign was a scratch on the temple. The *post-mortem* examination showed that the organs were in a condition which exposed the lad to cardiac failure at any time, apart from electrical shock. On the other hand, a case is described in which a similar current entered directly over the heart region, and the only serious consequence was the singeing of the skin of the breast. Of the two remaining sections of the *Atlas*, one deals with the effects of lightning on the body and the clothes, and the other with the effect of the electrical current on metals. The corrosive influence exerted upon gas-pipes and water-pipes by vagrant earth-currents is well brought out, and the illustrations show in a striking manner how lead and iron—particularly the former—become pitted and perforated as a result of this electrolytic action. The author states that lead poisoning, through the decomposition of lead in the drinking water carried by the conduits, may sometimes be set down to this factor. A good deal depends upon the chemical composition of the soil in which the action takes place. For its authority and its lucidity the *Atlas* deserves a place in all medical libraries.

The first of four volumes dealing with physical agents in therapeutics, Dr. Nogier's work on electro-therapy[8] is something between a manual and a textbook, and is as full of useful detail as either the student or the practitioner can desire. The first section is concerned with the technical matters involved in the production of the different currents—galvanic, faradic, high-frequency, etc—for medical purposes, and this is followed by a discussion of the physiological actions of electricity and the uses of the currents in diagnosis. Nearly half the volume however, is given up to the question of electricity in treatment, and here the electro-therapeutist will find several things to interest him from the point of view of his own protection. In discussing paralyses of cerebral origin, the author lays stress upon the necessity of warning the family of a hemiplegic patient against the appearance of the secondary contractions, otherwise the electro-therapeutist may be accused of having aggravated the patient's condition. He says that electrical treatment, properly applied in cases of hemiplegia, never provokes these grave after-effects, but the faradic current, given more or less indiscriminately, may have serious results. He finds the galvanic current the more satisfactory, and in certain forms of hemiplegia he advocates its exclusive use, though he is rather disappointed with results in this condition, as well as in syringomyelia and tabes dorsalis; with regard to tabes, however, he is more optimistic than some of his French colleagues. He is more hopeful when speaking of neuralgias; in dealing with facial paralysis, contrary to the advice of some British specialists, he recommends that the current should not be applied immediately, but about fifteen days after the commencement of the attack. More than one hundred affections in which the currents have proved of more or less benefit are noted, and the Cinderella of the therapies has good reason to be gratified by the way in which she is represented in Gilbert and Carnot's noteworthy *Bibliothèque*.

Although it is largely a compilation of the experiences of others, Dr. H. Evelyn Crook's *High Frequency Currents*,[9] which has deservedly reached its second edition, is an interesting work, well calculated to commend the judicious employment of vibratory electrization to the medical profession. Dr. Crook describes very lucidly the methods of producing this form of electrical disturbance, and gives an outline of its physical properties. From these he passes to a consideration of the physiological effects of the currents, reciting at length the experiments of Continental workers. It is useful to have this summary by one evidently so well acquainted with French and German work, even though some of the experiments in question will be already familiar to many readers. A chapter on the effects of the currents upon micro-organisms is included. It is the author's conclusion, after noting the observations of d'Arsonval and others, that high-frequency currents do not exert any specific influence upon micro-organisms, although by modifying the chemical constitution of the culture media they appear to retard their development to some extent. In the final section—on the therapeutical uses of the currents—many interesting cases are brought forward. The best results on Dr. Crook's list have been obtained in the treatment of chronic rheumatism and gout, but the currents are unsuitable for the acute form of those disorders. A new chapter in this edition describes the influence of the currents upon the circulatory system, where the effects are strikingly divergent. Indeed, the author points out that with regard to their action on arterial tension there seems to be a kind of antagonism between the two forms of high frequency. There is also a note on "fulguration," respecting which the author says that the effects are produced "by a coarse kind of mechanical action." But recent work by Bergonié and others seems to point to a finer and deeper effect upon the tissues.

GENERAL ANAESTHESIA.

In the preface of his little book on *Surgical Anaesthesia*[10] Dr. Bellamy Gardner expresses the hope that it may be read through in three sittings, "so that the reader may be interested more in the bearing of medicine and surgery upon the subject than perplexed by the mechanical detail of apparatus." No one who reads the opening chapter on the history of anaesthesia can fail to be interested; in the ensuing chapters on cardinal principles, the physiology, pathology, and peculiarities of anaesthesia, he will find instruction simply but insistently instilled. Inhalation narcosis alone is dealt with; there is no reference to any method of producing analgesia by local injection, and none to such adjuvants as scopolamine, but nitrous oxide, ether, and chloroform are dealt with pretty thoroughly in all the better known combinations and methods. Some account of ethyl chloride is found, but the author says he has discontinued its use. The Vernon Harcourt inhaler is described, but evidently not with the familiarity of constant usage. In this connexion it is worth remembering that in some of the German hospitals in which similar apparatus has been installed no improvement in the mortality figures as regards chloroform is apparent. Dr. Gardner is a warm adherent of the "gas and oxygen" combination for dental work, especially when given through the nose, combining the instrument of Paterson and the concentric bags of Levy. He also speaks very highly of ether as administered by the "open" method; the large quantity of the drug employed is of little moment compared with the material advantages of great safety and good muscular relaxation. It is already well known that the author shares Dr. Hewitt's predilection for the CE mixture. As regards apparatus, he has his preferences of course, but he is not dogmatic as to the choice of any particular form, and his descriptions are as satisfactory as book descriptions need be. The best part of his work is

[8] Gilbert and Carnot's *Bibliothèque de thérapeutique. Physiothérapie: (1) Electrothérapie.* Par Dr. Thomas Nogier, Professeur agrégé of the Faculty of Medicine at Lyons. Paris: J. B. Baillière et Fils. 1909. (Post 8vo, pp. 544; 251 illustrations. Fr.10.

[9] *High Frequency Currents.* By H. Evelyn Crook, M.D., F.R.C.S. Second edition. London: Baillière, Tindall, and Cox. 1909. (Demy 8vo, pp. 244; 49 illustrations. 7s. 6d.)

[10] *Surgical Anaesthesia.* By H. Bellamy Gardner, M.R.C.S., L.R.C.P. London: Baillière, Tindall, and Cox. 1909. (Cr. 8vo, pp. 247; 35 illustrations; 12 plates. 5s.

a thoughtful attention to details, that must impress the most casual reader; many of his remarks will be noted with profit by surgeon and dental surgeon alike. It is, perhaps, not always possible to reach the required depth of anaesthesia whilst keeping in touch with the corneal reflex—a criterion of safety rather emphatically laid down.

EXPERIMENTAL PSYCHOLOGY.

THROUGHOUT the numerous textbooks on general psychology, in many books, and still more in monographs dealing with psycho-pathological research printed in special journals, are to be found scattered the descriptions of the methods employed by their authors in the new and promising field of experimental psychology. The student, however, as Professor MYERS says in the preface to his *Textbook of Experimental Psychology*,[11] who wished to pursue a course of independent reading, would require a small library of books and periodicals. A special manual on this subject, therefore—at any rate, in English—has been for long badly needed. This lack Professor Myers's book admirably fills.

Assuming a knowledge by the reader of general psychology, and after a survey of the scope and aims of psychological experiment, Professor Myers opens with a description of the work on sensation—cutaneous, visceral, auditory, visual, etc. This subject is treated very fully, occupying, indeed, over one-fourth of the whole book; but, as the author says, the best training for the beginner lies in the field of sensation. The student is next introduced to statistical methods. It is true that this introduction is somewhat brief, and might be extended with advantage; but as the methods concisely outlined in this chapter, which only takes up eight pages, are employed throughout the following chapters and are supported by explanatory exercises at the end of the book, the reader should be able to obtain that grasp of modern refined statistical methods which is essential for serious work. As Professor Myers says, from the psychological standpoint, an average is often a blurred result, the chief value of which is to draw attention to individual variations and to the conditions producing them. What is meant by the "mean," the "mean variation," the "standard deviation," and the "probable error" is therefore explained in the text, and still further elucidated in the exercises, before passing on to the succeeding chapter on reaction times.

Memory is treated at considerable length, both in the chapter expressly devoted to it and also in the following chapter on muscular and mental work, but the description of Kraepelin's analysis of the work-curve is treated rather cursorily. Possibly this is because the author does not believe that in the present state of experimental pyschology a separation of fatigue and practice and a more or less accurate estimation of the relative values of these two factors in the results of work tests is possible.

The remaining chapters deal with psycho-physical methods; the estimation of weight and the sense of effort; "local signature," that is, the difference in respect of character of sensations—for example, retinal and cutaneous—similarly excited by the same stimulus; identity and difference; binocular and binaural experience, attention, and feeling. These last two chapters are very brief; in the former no doubt because so little is known of the fundamental nature of attention and because of its doubtful susceptibility to measurement. The chapter on feeling, however, might very well have been amplified, not only because of the interesting work which has been done in this direction, but also because of its great importance in the study of psycho-pathological states. The work of Jung and Peterson it is true is included in the bibliography, but the valuable results of word-pairing methods and the light which modern psycho-analysis throws on hidden and subconscious effective processes are nowhere discussed. Breuer is mentioned only in connexion with labyrinthine sensations, and we have looked vainly for the name of Freud. The reason for this is given in the preface, where the author states that owing to unsatisfactory methods and insufficient knowledge of subconscious and abnormal states, these subjects are as yet too controversial in character to come well within the scope of an elementary textbook. It is not to be denied that there is some truth in this, but considering the importance of the subject and the great amount of valuable work which has been done within recent years, it would surely be possible to sift from it much valuable evidence, or, at any rate, to describe methods which are already giving important results. We hope that this will be done in the future editions of a book which we cordially commend to the student as a most helpful work.

[11] *A Textbook of Experimental Psychology.* By Charles S. Myers, Lecturer in Experimental Psychology in the University of Cambridge; Professor of Psychology, King's College, London. London: Edwin Arnold. 1909. (Post 8vo, pp. 448; 66 figures and diagrams. 8s. 6d.)

NOTES ON BOOKS.

WE have received from the National Food Reform Association a revised edition of its little booklet, entitled, *Hints Toward Diet Reform, with Twenty-four Simple Recipes.* Such of them as we have tried proved excellent. The objects of the society are to enlighten public opinion on matters of diet; to point out the dangers of our present system of food supply and its bearings on such problems as the adulteration of food and milk, infant mortality, consumption, and physical deterioration; to make known the intimate connexion of diet with (*a*) moral and physical well-being, (*b*) social reform, (*c*) economy—national and domestic; to urge the necessity of reconsidering the dietary of schools and colleges, the army and naval hospital asylums, prisons, and other institutions; and, finally, to recommend more humane, hygienic, and scientific methods, both in the selection and preparation of food. The society has its habitation at 178, St. Stephen's House, Westminster.

THE SIXTEENTH INTERNATIONAL CONGRESS OF MEDICINE.

BUDAPEST, AUGUST 29TH TO SEPTEMBER 4TH.

(*Continued from page 890.*)

SECTION OF BACTERIOLOGY AND MICROBIOLOGY.

The Mode of Infection in Tuberculosis.

THE chief papers on this subject were read by BAUMGARTEN (Tübingen) and KITASATO (Tokio). The former first examined the theory of aërogenic infection. Leaving aside the question of predisposition, he found that the human patient, by expectorating, hawking, speaking, etc., sprayed bacilli into the air. The bacilli would thus be suspended on droplets for a considerable time, and could gain an entrance into the body by way of the mucous membranes of the cavities to reach the lungs, glands, and other organs. Experimentally attempts had been made to demonstrate a direct aërogenic infection by spraying large quantities of dried bacilli which animals were forced to inhale. But the conditions of these experiments were such as never occurred in actual life. Next he referred to experiments with spraying of fluid containing masses of virulent bacilli. Here, again, he contended that the forced conditions were quite artificial, and could not be accepted as proof of the aërogenic infection in human beings. On the other hand, he stated that it could be experimentally demonstrated that, provided the lungs were allowed free play, and the air contained considerable quantities of bacilli, the lungs remained free from germs, while the epithelial cells of the mucous membranes caught up the bacilli from the air and passed them on through the lymph stream to the filters—the lymphatic glands—and thus on to the various organs. Recent observations had tended to disprove the existence of a direct aërogenesis of tuberculosis. Enterogenesis in Baumgarten's opinion did not play a part in tuberculosis in man. This conclusion he attempted to base on the results of experimental work. He passed on to the consideration of what he termed *gennaeogenesis*, by which he meant a form of intrauterine infection. Bacilli had been found in the ova of some animals. In man bacilli had been found in spermatic fluid, even if they had not been found in spermatozoa. The experiment of injecting an emulsion of bacilli into the vagina of animals immediately after a fertilizing coition had been followed by a latent infection of the embryo, although the mother remained healthy. This he regarded as proof that spermatic fluid containing bacilli could infect the ovum. Renzi's experiments had proved that tuberculous mothers could pass on bacilli to their fetus. He stated that

the maternal infection took place through the placenta. About 50 per cent. of the placentae of tuberculous mothers showed signs of disease. Severe tuberculous implication of the placenta no doubt would lead to the death of the fetus, but mild affections would be likely to produce a latent tuberculosis, which might become generalized under certain conditions in later life. He was therefore inclined to regard "gennaeogenesis" as much more important than enterogenesis or aërogenesis. An animated discussion followed, in which, among others, Pfeiffer, Lubarsch, Wysokowicz, Heymann, Salomonsen, Gruber, Generich, and Hútyra took part. The majority of the speakers did not accept the views put forward, although Baumgarten obtained support on some points.

Kitasato described the measures employed in Japan of combating tuberculosis, and spoke of the occurrence of the disease and of his work in its investigation. The main facts and views of this communication have already been published by the author.

Bacteriology of Acute Rheumatism.

Rosenthal (Paris) read a paper on the bacteriology of acute rheumatism and its treatment. He criticized the researches of Poynton, Paine, Walker, Meyer, and others, and attempted to prove that the diplococcus, which has been associated with the disease by the observers named, was nothing else than the enterococcus of Thiercelin, and that it played only a secondary part in rheumatism. He then discussed the characteristics of the anaërobic bacillus of Achalme, which he believed to be the causal organism. His methods of employing sealed capsules in Thiroloix's haemobioculture (the bacilli are sown in the blood during the life of the animal) gave him excellent results. He further stated that the bacilli could transform themselves into diplococci both *in vitro* and *in vivo*. His methods of treatment included the employment of colloids (electrargol), sodium salicylate, bacterial vaccines, and a serum prepared by injecting aërobic and anaërobic cultures of the Achalme bacillus into horses.

Histogenesis of Cancer.

Raymond Tripier (Lyons) attempted to show that the histogenesis of cancer and the constitution of the disease were analogous to the histogenesis and constitution of other pathological lesions usually spoken of as inflammatory. He regarded the initial lesion in all neoplasms, both benign and malignant, as mechanical, depending on an alteration of the vascular apparatus.

Teratoid Tumours.

Askanazy (Geneva) dealt with some investigations on teratoid tumours. He found that the rat served best as the experiment animal. Positive results were obtained by inoculating only portions, and not whole embryos, into the peritoneum or subcutaneous tissue, but not into the cranial cavity. After relating several points of interest in connexion with his observations, he stated that he was able to prove that the animal organism as well as the influences exercised on the embryonal tissue, played an important part in determining the nature of the ultimate fate of the embryonal tissue. He found that it was not possible to increase the power of growth by repeated inoculations, and that the fourth transplantation always failed. Mixing emulsified embryonal tissue with an emulsion prepared from freshly removed human carcinoma regularly prevented the appearance of teratomata. This, he considered, was analogous to the inhibition of cancerous tumours in mice, etc., by the inoculation of embryonic tissue of the same species. The development of the teratoid tumours was inhibited by soaking the embryonal emulsion in Fischer's scarlet oil. On the other hand, when he mixed the embryonal emulsion with *Acither-wasser*, the tumours took on extraordinary growth. This he regarded as proof that the embryonal tissue could be directly influenced to grow in its new host. The author further reported a single observation in which a malignant tumour developed on the basis of an experimental teratoma. In conclusion, he reviewed the present state of knowledge concerning teratomata and blastomata in general.

Section of Therapeutics.

The Congress as an Advertising Medium.

The programme of this section included some eighty-three papers, and this number was increased by a few announced at the last minute. A large proportion of the papers were printed or typed beforehand, and several of those which were distributed in this way were never read, the authors not having taken the trouble to travel to Budapest. That many of these communications are of doubtful scientific value increases the suspicion that the Section of Therapeutics at medical congresses is utilized for the purpose of advertising some special method of treatment. More than that, a careful perusal of some of the papers awakens a further suspicion that the readers are anxious to bring their names before the medical world in the hope that some special mode of dealing with disease may, perchance, bring some new patients. In some cases the authors of papers derive a large proportion of their patients in this way, by seeking other members who will recommend the author. It is not surprising that, in some of these instances, the medical practitioner in question should have the reputation among his local colleagues of not being able to retain any of his old patients, and of being dependent on a constant supply of fresh ones, in order to keep up his practice.

Serum Therapy.

Bourget (Lausanne) expressed his belief that the modern doctrine of toxins, antitoxins, endotoxins, aggressines, alexins, bacteriolysins, and so on, was nothing more than a display of learned sounding words without any meaning, and that the serum treatment of typhoid fever, diphtheria, tuberculosis, tetanus, meningitis, etc., was useless. The paper was followed by a discussion, in which Gerlóczy, Blondel, Carrien, Deutsch, Bokáy, Kiraly, and Herczeg took part; the author's views found no support.

Animal Poisons.

Faust (Würzburg) presented a communication on some actions of the animal poisons. In the first place, he dealt with the pathogenesis of bothriocephalus anaemia, referring especially to the part played by oleic acid as a blood poison. He further raised the question whether this substance might not be responsible for some of the so-called pernicious anaemias. Turning to the venom of the cobra, the author spoke of a toxin, which he called *ophiotoxin*, which he regarded as the active substance. This ophiotoxin is not a toxalbumin, but should be classed among the sapotoxins, both on account of its pharmacological and of its chemical properties. He also dealt with the active substances of the poisons of snakes, fishes, scorpions, and spiders.

Muco-membranous Entero-colitis.

Raoul Blondel (Paris) dealt with the etiology and treatment of muco-membranous entero-colitis. He regarded this disease as a manifestation secondary to some disturbance of the nervous system. The symptoms were explicable on the assumption of a reflex disturbance of the secretion and motor functions. The patients, he said, always exhibited a neuro-arthritic stigma. He, however, recognized external causes which determined the onset of the colitis. These causes included enteroptoses, floating kidney, displacements of the uterus, adhesions in the neighbourhood of the uterine appendages (either post-inflammatory or post-operative), peritoneal bands, intestinal lithiasis, intestinal parasites, and hyperacidity of the gastric secretion. The treatment which he advised was: First, to remove, whenever possible, the external cause; secondly, to treat the general condition by means of a vegetable diet, forbidding alcohol, tobacco, and coffee; hydrotherapy, massage, exercise, and drinking of Plombières waters; thirdly, to treat the intestines locally (including bacterio-therapy), forbidding eggs in any form, and employing little or no intestinal lavage; and, fourthly, to treat the painful attacks by compresses, to treat the constipation by castor oil, gelose, enemata of bicarbonates, and the diarrhoea by ichthyol.

Leucocytes and Absorption and Elimination of Medicaments.

Arnozan and Carles (Bordeaux) read a paper on the part played by the leucocytes in the absorption and

elimination of medicaments. The authors found that several substances were taken up by the leucocytes at times after the medicaments had been split up or otherwise altered chemically. The drugs were thus not dissolved in the total quantity of fluid blood, but were concentrated in the blood cells, to be liberated in certain situations, notably ulcerated surfaces, where an intense medicamentous action might be evolved. Reference was also made to the effect which this loading of the leucocytes had on their phagocytic action.

Roncegno Water in Graves's Disease.

GARRY (Cairo) read a paper on the therapeutic value of the water of Roncegno in Graves's disease. This water contains arsenic and iron. The author stated that 37 cases had been treated during the past six years, of which 20 had been completely cured, 8 had been almost completely cured, and 5 had been slightly improved; the remaining 4 did not benefit.

(To be continued.)

LITERARY NOTES.

IN a note on an old medical worthy of Keith which appeared in the JOURNAL of September 25th, the name was printed "Douglas." It should have been "Dougall." The writer wishes to say that he has not even the somewhat doubtful satisfaction of laying the blame on that convenient scapegoat, the printer's devil. The fault was wholly his own, and he apologizes to the shade of William Dougall for his inadvertence.

We learn from the *New York Medical Journal* that the *Transactions* of the Sixth International Congress on Tuberculosis held last year at Washington have recently been issued. They make six volumes, containing in all 4,832 pages. These volumes constitute in themselves an almost exhaustive library on the subject of tuberculosis. "At the time of the Congress," says our contemporary, "it was announced that the *Transactions* would be published in the course of three months, but everybody of much experience in editorial work felt that such an expectation could not be realized with due regard to careful editing. Those who had the work in charge must soon have come to take the same view of the matter, and they have shown wisdom in doing the work thoroughly rather than in hasty compliance with an ill-advised promise."

Mr. Henry Frowde, of the Oxford University Press, informs us that the forthcoming number of the *Quarterly Journal of Medicine* includes the following articles:—On leukanaemia, by Dr. Charles H. Melland; a contribution to the study of rheumatism, with notes on the after-history of 25 cases of "scarlatinal rheumatism," by Dr. F. J. Poynton; on lymphocytosis of the cerebro-spinal fluid in relation to tabes, by Drs. Judson S. Bury and Albert Ramsbottom; polycystic disease of the kidneys, by Dr. Carey Coombs; an investigation into the histological condition of the suprarenal glands in conditions associated with a high blood pressure, by Dr. Austin Philpot; on the diuresis of chill, by Dr. Alexander Gibson; toxic arthritis, by Dr. J. Campbell McClure; some observations on the oral administration of T.R. tuberculin in pulmonary tuberculosis, by Drs. David Lawson and H. S. Gettings; some further remarks on leukaemic and chloromatous affections, by Dr. C. H. Treadgold; the estimation and quantitative significance of hydrochloric acid in the gastric contents, by Dr. W. H. Willcox.

We are informed by Messrs. J. and A. Churchill that the *Medical Directory* for 1910 will contain a descriptive list of all the most important British spas and health resorts. It has been compiled by Dr. Norman Hay Forbes, ex-Vice-President of the British Balneological and Climatological Society. The *Medical Directory* for next year is now being compiled, but the editors can still receive information. The same publishers have published another revised edition of Hale White's *Manual of Materia Medica*. This work was first published in 1892. The present is the eleventh edition of the book.

The Council of the Bethnal Green Free Library is making an earnest appeal for a reserve fund of £10,000. The institution was founded by the late Dr. William Tyler, brother of Sir James Tyler, well known in the City of London as a prominent citizen and friend of all good work. Although his ample private means should have allowed Dr. Tyler to have passed a life of ease amid more congenial surroundings, he chose to pass a life of self-denial among the poor. In founding the library he did a work which attracted the notice of the late Queen Victoria, who sent her works with her autograph; of the present King, who contributed handsomely in books; and of the Prince of Wales, who has sent £10 to the reserve fund. There are now over 30,000 volumes in the reference section, while the lending department has over 8,000 in addition. The year's income of £1,222 leaves an adverse balance of £215. The library does not merely receive gifts, however; grants of surplus stocks are often being made to outside institutions. Evening classes are held, and free concerts are given; both are increasingly appreciated.

Messrs. W. B. Saunders Company will publish shortly a work on malaria by Dr. Wm. H. Deaderick. Special stress is laid on diagnosis and treatment. It is stated that the third cycle of the malarial parasite—the parthenogenetic cycle—is described for the first time in any language. The book will be fully illustrated by a number of original pictures.

The *Revue Mensuelle de la presse médicale Italienne*, the first number of which was issued in June last, is intended to make the results and observations of Italian workers more widely known to their professional brethren throughout the world, to a large proportion of whom Italian medical literature is a sealed book. The new journal is published at Milan, under the editorship of Dr. L. Mongeri, who has many of the leading members of the profession in Italy as collaborators.

We take the following extract from "The History and Antiquities of Kilmacduagh," from the *Canadian Practitioner and Review*:

The circumstances under which Ulick de Burgo received the name, Ulick of the Heads, was extraordinary. It is difficult to discredit them, considering they are found in the pages of a scholar so learned, so conscientious, and so favourably known as the author of *Cambrensis Evernus*. Ulick was confined in his castle at Dunkellin for a considerable time by paralysis, which in those days (1542) of active warfare was sure to be attended with serious consequences. Accordingly, his possessions were seized on by neighbours, some of whom were his own kindred. After plundering his extensive territory, they attacked his residence, intending to make him prisoner, and seizing all that remained. Bedridden as he was, when it was told that those bound to him by the closest ties of blood had hearts so merciless as to deprive him, a cripple, of the necessaries of life, his rage knew no bounds. He forgot his weakness, and cried aloud for "A horse, a horse!" "May not," he added, "the great God who took away the life of my limb restore it again, and enable me to recover my cattle from those merciless thieves?" His attendants, awed by his anger, yielded to his wishes, and placed him with difficulty on horseback. So feeble was he, that he was unable to remain in the saddle without assistance. Nothing daunted, he persisted to sit upright, "till at length the bones emitted a sound loud enough to be heard by his attendants, and in an instant the sinews recovered their strength." His enemies were terror-stricken as he came on the scene; he not only retook his cattle, but he brought back in triumph the heads of many of his enemies. Such was the remarkable occurrence that got him popularly known as Ulick of the Heads.

Cases are on record of paralytic patients recovering the use of their limbs to escape from a burning house, of an attack of gout being cured by a railway accident, of obstinate mucous colitis which had resisted all kinds of medical treatment disappearing under the influence of sudden danger, and of a lost voice being recovered under the stress of great mental emotion. A number of examples of such effects will be found in the late Dr. Hack Tuke's well-known book *Mind and Body*.

Public Opinion published its 2,500th number on September 24th. The first number of this well-known weekly review was published forty-eight years ago on October 5th, 1861, the editor in this issue calls attention to the history of *Public Opinion* and the stirring days in which it was started. The title of *Public Opinion* was suggested by Sir Robert Peel to George Jacob Holyoake when he said that "England was governed by Opinion." It was an immediate success, and won a big circulation both at home and abroad. The object of *Public Opinion*, which is edited by Percy L. Parker, is, while focussing the opinions and views of the week as given in the world's best newspapers, magazines, and books, to emphasize those movements and opinions which are becoming important and which promise to loom large in the future.

Medical News.

Dr. Daniel John Cunningham, late Professor of Anatomy in the University of Edinburgh, left personal estate valued at £17,846.

The next meeting of the International Congress of Otology will be held in Boston, U.S.A., under the auspices of Harvard University, in August, 1912. Dr. Clarence J. Blake, of Boston, has been chosen to be President.

A special commission of the French Senate, the reporter of which is M. Strauss, has recommended the prohibition of the use of feeding bottles with tubes, under penalty of fines from 2 to 100 francs, and imprisonment in case of repetition of the offence.

The subject of Professor Osler's address at the London School of Tropical Medicine, which is to be delivered on October 28th, is The Nation and the Tropics. The work of the winter session will begin in the first week of October as usual.

Sir John Byers has been re-elected President of the Belfast Natural History and Philosophical Society for the session 1909–10. The society is one of the oldest provincial bodies of the kind in the United Kingdom, the present being the eighty-sixth year of its existence.

The annual medical service of the Guild of St. Luke will be held in St. Paul's Cathedral on Wednesday, October 20th, at 7.30 p.m. The preacher will be the Rev. Father Waggett, S.S., J.E. For tickets and particulars application should be made to the Honorary Secretary, Dr. C. St. Aubyn-Farrer, 1, Harley Street, W.

At the opening meeting of the Eugenics Education Society to be held at the Caxton Hall, Westminster, on Thursday, October 7th, at 5.15 p.m., Lieutenant-Colonel C. H. Melville, R.A.M.C., Professor of Hygiene, Army Medical College, will deliver an address on Eugenics and Military Service. Mr. Arnold White will preside.

The Clinical Section of the Royal Society of Medicine is to hold its first meeting for the winter session next Friday, at 8 p.m. In addition to demonstrations of cases and specimens, papers will be read by Sir Dyce Duckworth on some cases of gout—one in a Mohammedan, the other in a boy of 14; and by Dr. Herringham on some cases of pneumonia in which displacement of the heart simulated pleural effusion.

The new laboratories for physiology, chemistry, and physics of the London Hospital Medical College will be opened by Professor William Osler, F.R.S., on Friday, October 15th, at 4 p.m. At 4.30 he will deliver the Schorstein lecture on Syphilis and Aneurysm. Members of the medical profession will be admitted on presentation of their cards.

The opening of the winter session at the Faculties of Science and of Medical Science at University College will be marked by the delivery of two public introductory lectures. The one dealing with radium emanations is to be delivered by Sir William Ramsay at 9 a.m. next Monday, and the other on Wednesday, at 7 p.m., by Professor H. R. Kenwood, the title of his address being, What Hygiene Demands of School Teachers.

According to recent reports from East Africa sleeping sickness is causing fearful ravages, both among natives and Europeans on Lake Tanganyika, particularly in the Ujiji district. The principal centre of the disease is at the mouth of the river Malagarayi, where it enters the lake, and the district running south from that point. The head of the East Africa medical staff, Dr. Speissner, has gone there to inquire into the measures taken against the disease.

The autumn meeting of the South-Eastern Division of the Medico-Psychological Association will be held, by the courtesy of Drs. Adams and Johnston, at Brooke House, Upper Clapton, N.E., on Wednesday, October 6th. Dr. F. W. Edridge-Green will read a paper on the theory of vision and colour perception, which will be illustrated with coloured lantern slides. Dr. T. Duncan Greenlees will present a communication on lunacy matters in Cape Colony. The members will dine together, after the meeting, at the Café Monico, Piccadilly Circus, W., at 6.45 p.m.

The nineteenth Congress of Internal Medicine will be held at Milan from October 4th to the 8th. Among the communications promised are a report of the existing state of knowledge in regard to cancer, by Professors Devoto, Moreschi, and Veratti one on Italian work in the field of internal medicine, by Professor Guiffré; and one on the mechanical and biological factors in the pathology of pregnancy. A special session will be devoted to tropical medicine, at which Professors Feletti, Gabbi, and others will read papers on Mediterranean fever, kala-azar, and other subjects. In connexion with the Congress there will be a meeting of those who take an active interest in the struggle against endemic cretinism, when a report on the subject will be presented by Professor Tamburini, and a meeting of the National League against Malaria.

The Board of Education of New York is, we learn from the *New York Medical Journal*, planning to remodel twenty class rooms in different public school buildings into open-air rooms, and equip them with special furniture. These rooms will be for the use of children who are anaemic and have a tendency to tuberculosis. Those already afflicted with the disease will not be accepted. The Board of Education now furnishes teachers for classes of tuberculous children on the ferryboats *Southfield* and *Middletown*, and is planning to supply teachers for the class on the roof of the Vanderbilt Clinic.

On the initiative of Dr. Castellino, Professor of Medical Pathology in the University of Naples, an Italian National League against malaria has recently been formed. The first meeting will take place at Milan on October 6th and 7th, when the Congress of the Italian Society of Internal Medicine will be in session in the same city. Among the communications promised are the following: Professor Bordoni-Uffreduzzi, on the present state of knowledge in regard to malaria; Professor Castellino, on prophylaxis against malaria; Professor Golgi, on the pathology of malaria; Professor Grassi, on some questions relating to the pathology and treatment of malaria; Professor Queirolo, on little known abortive forms of malaria. Professor Baccelli will preside, and will deliver an inaugural address.

Under the name of *Scapa*, or *A Beautiful World*, the Society for Checking the Abuses of Public Advertising has just brought out an issue of the occasional journal in which it records its work. The society came into being some sixteen years ago, and, considering the nature of the forces with which it is contending, has achieved some excellent results. Among them is the passage of an Act specifically dealing with the matter by authorizing local authorities to frame by-laws to protect landscapes, promenades, and public parks within their area from disfiguring advertisements of any kind. So far advantage has not been taken freely of the existence of this Act; but the leaven is working, and this year several county councils have submitted by-laws for approval by the Home Office. Apart from this the society has, by memorials and representations, induced certain advertisers to remove or modify advertisements to which objection was taken. The more specific objects of the society are to protect the picturesque simplicity of rural, river and other scenery, and to assert generally the importance as a great public interest of maintaining the elements of interest and beauty in out-of-door life. The journal contains many illuminating descriptions of the way in which beautiful scenery is at present prostituted to other uses, and a great deal of interesting information as to what is being done on the subject in other countries. The address of the honorary secretary is The Keir, Wimbledon Common. He, like the editor of the journal, modestly conceals his name. We wish the society well.

The usual monthly meeting of the Executive Committee of the Medical Sickness, Annuity, and Life Assurance Society, was held at 429, Strand, London, W.C., on September 17th, Dr. J. Brindley James in the chair. The accounts presented showed that the business of the society was steadily progressing. In every year of the quarter of a century during which the operations of the society have been carried on there has been an increase in the number of members and in the amount of the accumulated funds, and the records of 1909 show that this year will be no exception to the rule. The number of members now approaches 3,000, and the funds amount to nearly a quarter of a million sterling, a most satisfactory result for a society which pays no commission and has no agents. The sickness experienced by the society in its early years was very much under the amount expected and provided for in the tables of contributions; but year by year the difference between the experienced and expected sickness has grown smaller until it has almost vanished, and it seems likely that for the future there will be but a small margin of this kind. A considerable saving is made each year in management expenses and the funds earn a large margin of interest over the rate assumed in the valuation. In this way a substantial surplus is produced and there is every reason to hope that the society will be able for many years to come to pay the handsome bonus which is now allotted to every member at 65. Prospectuses and all further particulars on application to Mr. F. Addiscott, Secretary, Medical Sickness and Accident Society, 33, Chancery Lane, London, W.C.

British Medical Journal.

SATURDAY, OCTOBER 2ND, 1909.

THE FUNCTION OF THE MEDICAL LIBRARY.

AN old gibe against the clergy was expressed in the saying, *Initium sermonum finis studiorum*. This, we fear, might find an application to our own profession, though perhaps within a narrower range. Medicine being essentially progressive, both as a science and as an art, those who practise it must make some effort to keep up with its advance, unless they are content to be left behind. This they can now do by post-graduate study, but it is not easy or even possible for many doctors to find time for such refurbishing of their knowledge to an extent adequate for the purpose. But all can follow the onward march of science in books, or, better still, in the medical journals. The latter we think the better way for most, for it is easy and inexpensive, and shows as in a cinematograph the gradual growth of knowledge. In the book the results are winnowed, classified, and summed up; in the journal the work can be followed step by step. There are some excellent practitioners who think they can dispense with journals and even with books; their reading, they would say, is on the living body itself, and, like John Radcliffe, they would undertake to write down all medical knowledge on a sheet of paper. Yet Radcliffe founded a magnificent library, which made some wit compare him to a eunuch who should leave money to establish a seraglio. John Hunter was not a reading man; his library, as he boasted, was the dissecting-room. But Hunter was a genius, and then it must be said that he was more a biologist than a surgeon. Pascal, too, was no reader, but then to him geometry, as taught in the schools, was a collection of self-evident propositions. He went, like Herbert Spencer, on his way self-centred, and paying no heed to the work of others. How much "fuller," in Bacon's sense, would these men have been, and how much more they would have done in enlarging the boundaries of truth, if they had read more! Ordinary men cannot work alone in such splendid isolation; the doctor, in particular, must know what is being done in the medical world. If, as has been said, the whole art of medicine lies in observation, each man's own narrow sphere must be enlarged by knowledge gathered by others. It is not merely facts, but suggestions, that he gets from fellow workers; even their mistakes help him to avoid pitfalls in his path. In medicine, more perhaps than in any other department of intellectual work, it is impossible to be stationary; if we do not press forward we fall, slowly it may be but surely, backwards. To be successful the practitioner must be a student throughout his professional life.

In the address delivered at the inaugural meeting of the Medical Library Association held at Belfast in July, which will be found at p. 925, Professor Osler discusses the value of the medical library in post-graduate study with the fullness of knowledge and the charm of style characteristic of all his utterances. It is a truth which cannot be dwelt upon too much that what a man learns at college is to walk by himself without the help of leading strings, to see with his own eyes, and to use the weapons for fighting disease which science places in his hands. The foundation is laid for him; it is for him to build upon it. If he does not read, he inevitably falls into the state described by Professor Osler, when he "is fit to do only the "ordinary reflex practice, in which cough means an "expectorant mixture and heart disease digitalis." A glance at such a man's consulting room suffices for the diagnosis of this type: "The BRITISH MEDICAL "JOURNAL or *Lancet* lies uncut [to speak by the card, "this should have been *unread*] in heaps on the table "and not a book is in sight!" In this category of practitioners, according to Professor Osler, are "the "kickers, the knockers, the grumblers" of the profession; and they have not even a glimmer of consciousness that the fault is in themselves.

But how, it may well be asked, is a busy and worried man to find time for reading? He cannot do so unless he has acquired the habit. As Professor Henry Morley said long ago, a taste for reading can be gained in the same way as a taste for smoking. Every one, therefore, should sedulously cultivate the art of reading in the days of his youth. We speak of reading as an "art" deliberately. Samuel Johnson never read a book through in his life, but he got all he wanted out of a vast number of books, "tearing the heart out "of them," as Boswell tells us. The habit of reading, acquired when the mind is plastic, enables one to find readily what one wants in a book or journal; the rest can safely be skipped, for it is only what one reads with interest that remains in the memory. Professor Osler rightly urges people to get rid of the notion that much has to be read; one or two good periodicals—we are proud to note the BRITISH MEDICAL JOURNAL occupies a place among those which he enumerates—suffice. But they must be read thoroughly, each reader selecting what he requires and keeping the articles filed for ready reference.

In regard to books, Professor Osler gives the sound advice to buy with discrimination. It is here that the function of the medical library is most usefully exercised. From a library the doctor can borrow the monographs or large textbooks which he may require for reference, but cannot afford to buy. We are glad to have so weighty a testimony to the value of the library which the British Medical Association has collected for the benefit of its members. How greatly it is appreciated by them is shown by the numbers who come to read therein. Every effort is made to make it more and more useful to members and to the profession at large.

Much more could be said on the subject so well treated by Professor Osler, but we prefer to refer our readers to the address itself. Naturally, as a lover of books he has a good deal to say about bibliography and bindings; but we have not space to discuss these things. We join earnestly in his recommendation that all doctors should have a hobby. It matters little what it is provided it interests him sufficiently to distract his mind from the cares of professional life.

MENTAL ATTITUDES IN PATHOLOGY.

IN this very material world living things are usually classified according to their physical characteristics, but conceivably biologists in Mars adopt a different system and class all vertebrates as embodied Interrogatives. In any case a mental glance over the animal kingdom suggests that among less tangible attributes the one least indisputably characteristic alike of birds, beasts, and fishes is Curiosity—subjectivity to the attraction of the unknown. In respect

of some animals—for instance, *Felis domesticus*—curiosity would appear to be a quality not without its disadvantages, for we have the high authority of nursery tradition for believing that it was Curiosity that killed the cat—robbed it at one fell swoop of all its many lives—while time and again travellers, and other folk proverbial for their accuracy, have assured us that it is by an appeal to this characteristic that they induce animals to come within range of their weapons. But in mankind Curiosity truly appreciated is a virtue without blemish, an attribute so valuable, yet often so maligned, that by way of protest we spell its name with reverence and a capital letter. It is a quality with such outcomes that it might almost be said that it is to his greater endowment in this respect that man owes all his bygone progress—his discovery that two limbs can be made to do the work of four; his knowledge of, among other trifles, the law of gravity; his mastership over the brute beasts which have no understanding, or in other words, less curiosity; his position at the head of the general class in which our Martian biologist would place him. In some individuals this quality is entirely absent—we have it on their own authority—so it would not appear to be an attribute essential to man's mere existence, but it is only by fostering and exercising his curiosity that he can hope to develop still further. It exists, of course, in several grades—the curiosity which merely says What? that which asks How? and that which cries When and Why? The "What" type, represented by the boy who loses all interest on finding that his sister's doll is stuffed with sawdust, is not very productive. The next type, represented by the child who rests satisfied when informed—correctly or incorrectly—how the milk got into the cocoanut, is a somewhat higher grade. But we only reach the really productive type with the When? and the Why? These are the greater which include the less, for the efforts which they induce involve an answer to all lesser interrogatives and thus lie at the root of all progress.

For these reasons we are inclined to side with Dr. Sainsbury, whose article, published at page 928 of this issue, has evoked—perhaps rather unexpectedly—the foregoing considerations. He is dissatisfied with the attitude towards their work of the pathologists of to-day, and if he adopted our classification would be disposed, we fancy, to put them at present among people gifted only with the lowest grade of curiosity—with the little boys who merely say "What?" As a rule a pathologist, when engaged on a *sectio cadaveris*, merely asks himself what was the cause of death—searches for the peccant organ, and, having found it, enters the title of its condition in his book; or, if its characteristics are especially well marked, removes it in whole or in part, mounts it in an appropriate medium, and places it in the museum with a label denoting its origin and general characteristics. That done, he deems he has fulfilled the whole duty of man in matters pathological.

But the mental attitude of the pathologist at a *sectio cadaveris*—of a curator in his work-room—should be somewhat different. It should be less one of What than of Why; Why did life cease? not, What was the cause of death? To some minds, of course, the two phrases may seem absolutely interchangeable, but really they connote very different things. For instance, as Dr. Sainsbury would seem to suggest—not by way of putting forward a theory, but in illustration of his meaning—that the difference between life and death is the sum of two forces, momentum and resistance. So long as the momentum is the higher, the vital, the electric, current is continuous. When resistance gets the upper hand the current is cut, life ceases. It is the peccant organ which, among other things, represents the resistance, but why, at a given instant, does it become fatal? The peccant organ does not become peccant in a moment, but in days, in weeks, or years. A kidney, for instance, which is slowly becoming cirrhotic—the major part of which is already, indeed, cirrhotic—continues to secrete urine for years; but when did it begin to limit its output, and why did it suddenly cease to be merely peccant and become actually criminal, overcoming momentum, and arresting the course of life?

We gather, in short, that Dr. Sainsbury would have the *post-mortem* room officer, the hospital pathologist, devote his researches less exclusively to ascertaining the ostensible cause of death, pay more attention to the correlation between the condition of imperfect organs and the continuance of function; find out how far a given organ, arrived at a certain degree of imperfection of structure, has yet proved capable up to the moment when life gave place to death of fulfilling its normal function, and label his specimens accordingly. Let the pathologist continue to satisfy himself—to point out to students—what is primarily the offending organ; but let him go further, and discover and describe how it is that, in spite of the condition of that organ, life has yet for a time continued. Our curiosity at present is insufficiently insistent; we are content to leave unanswered a thousand questions which might well be asked and answered. Why in this case of heart failure was there general anasarca, and in that one only limited visceral congestion? Why did A, whose lungs show merely one or two cavities, die a lingering death in his bed, while B, whose lungs are riddled, lived to be killed by a motor car? What is really the difference between the cases? Why was the factor, which in the one case enabled momentum to overcome resistance, lacking in the other?

In many cases, indeed, we are so incurious, or our curiosity is so essentially of the type of What, that when we speak as pathologists pure and simple, our ascriptions of the cause of death—though they satisfy Mr. Troutbeck as long as they are furnished by an "expert"—are often no more really elucidatory than would be a statement that the patient died from want of more breath. We should, in short, as Dr. Sainsbury suggests, enter the *post-mortem* room and the pathological museum looking at life and seeing not inanimate structures, pictures of still life, but the instruments—more or less faulty—of life, the impediments—more or less obstructive—to life. We should endeavour to conjure back the vital spirits and see these in active play within the organs and tissues up to the moment when life ceased, and continually ask why it ceased. If this attitude towards pathology were the rule rather than the exception, progress in our knowledge of the processes of health and disease, of the true relation of function to structure, would possibly become more active, and in any case the teaching of pathology to students would certainly be more vivid and inspiring. Light, too, might be thrown upon such very practical points as the prognosis of heart disease—on the comparative mystery represented by the fact that one person dies of heart disease in a month or in a year, while another, whose heart is morphologically in an apparently infinitely worse condition, lives to a good old age. Similarly, it seems likely that the everyday work of the

practitioner would be furthered; the true cause of a chronic malady can rarely be absolutely removed, the diseased organ made thoroughly sound, but within certain but at present unascertained limits continuance of life is compatible with great imperfections of visceral structure. Partial performance of its function by an organ, or the vicarious efforts of a functionally allied part, suffice to spell all the difference between gaps which the vital current can and cannot overleap—between life and death—and it is on his knowledge of the possibilities in this direction, on the extent to which he knows how to make other organs give their assistance, that a medical man who treats his patient scientifically must mainly depend for therapeutic success.

Ideas such as those contained in Dr. Sainsbury's paper have doubtless passed through the mind of every pathologist, of every habitual visitor to a *post-mortem* room; indeed, in his laboratory museum at Claybury Dr. Mott deals with his specimens, we believe, much on the lines advocated; while Sir Jonathan Hutchinson presented to the Polyclinic an admirable collection of the same general order. But certainly they have never, so far as we are aware, been put forward in such concrete form as that which Dr. Sainsbury has given them. For that reason we direct special attention to his paper, the complete bearing of which is here but very imperfectly indicated.

THE PRACTITIONER AND HIS TUBERCULOUS PATIENTS.

WITHOUT in any way wishing to dictate to the family doctor what should be his attitude towards his tuberculous patients, we venture to make some suggestions which may be of assistance not only to the patient, but also to the practitioner in whose charge he or she is placed.

At the outset it should be understood that our remarks apply more particularly to the cases such as have been described as cases of "open" tuberculosis—that is, cases in which the contents of a tuberculous lesion reach to the outside of the body in the form of discharges, expectoration, etc., and so forth. There is no need to insist upon the highly infectious nature of this material, for that is well known. But what is equally well known is that patients who are so afflicted are frequently kept in complete ignorance of the malady which has fastened upon them; and what is also well known is that even those to whom the patient is related or who live in the closest relationship are also kept uninformed of the true state of affairs. No doubt in the first case the doctor is acting upon the principle that the patient should be spared the distress which is inevitable when the pronouncement of the infection is made; and it is probable that in the second case the practitioner is actuated by the same benevolent purpose. The medical man is now, however, no longer looked upon as an individual to whom are entrusted all matters relating to this disease, and he must realize that his kind intentions may be interpreted in quite another sense.

It may be difficult at the present day to convince the sufferer or his relatives that the true state of affairs was not disclosed out of consideration of their feelings. The patient may, after six months' private treatment, seek admission to a special or general hospital to the wards of which only early cases are admitted, the rest being treated as out-patients, and with full knowledge of the true state of affairs, since the sputum has been found to contain the germs of the disease and elaborate rules have been given to the patient to guide him so as to prevent the spread of the disease. Moreover, the patient, with his own consent, may have been notified to the local sanitary authorities as a tuberculous subject, his home visited and cleansed, while other suspect members of his family have been singled out for special examination by the hospital physicians. As to the patients who are found to be in advanced stages the hospitals can do no more than recommend them to seek aid at the local Poor Law infirmaries.

Can the family doctor wonder for a moment how it is that the net result is his discomfiture and undoing? It is also a fact that the hospital physician is in an equally difficult position, for by the rule of his institution he is perforce obliged to act the part of an informer against the practitioner who has had charge of the case for so many months without giving the patient or his friends the fullest information about the malady. The remedy for this most serious state of affairs is a simple one, but it entails more trouble on the part of the private doctor and in some cases fresh study by him regarding the developments which have taken place in the hospital management of these cases, and in respect of sanatorium treatment. He must learn to treat all such cases with the full knowledge that hospitals eager to obtain subscriptions for their maintenance will not hesitate to sacrifice the reputation of a practitioner. They do not mind whether his particular management of his cases has been prompted by humanitarian motives or by motives of personal gain, or, sad to relate, by that carelessness or wilful negligence with which his former patients are disposed to charge them. When tales of apparent neglect get about, is it to be wondered at that lay district visitors hearing such accounts spread them broadcast, stir up the charitable rich, and collect funds to originate all sorts of schemes for building dispensaries and endowing them, so that special medical officers may be employed with fixed salaries, to look after such cases to the distinct loss in a pecuniary sense to the medical man who, a few doors away, is endeavouring to maintain himself and family?

One thing is quite certain, that our profession is, in its present condition, incapable or unwilling to check these efforts; the arguments used cannot always be be gainsaid, and medical men have not the initiative or desire to correct the present state of affairs. So long as hospitals, dispensaries, and other charitable institutions are run on the lines upon which they have been started and maintained in this country, the general practitioner must realize how much is being done by them to stem the tide of the spread of consumption, to detect it in its earliest stages, and to treat it on rational lines. He must, in the first instance, realize that it is impossible to be accurate in his diagnosis without an appeal to the microscope. Every effort should be made to prove the existence of tubercle bacilli in the discharges, and he has the right to expect payment for such extra trouble. There is little doubt that herein is the root of the present trouble, for general practitioners, and for the matter of that consultants are to this day often heedless of the propriety of examining the sputum of all cases of suspected tuberculous disease.

And here a word is necessary as a warning to our medical schools. Their methods of teaching are in some degree out of date, and they are responsible for the ignorance not only of older practitioners but of the recently qualified student in matters connected with

the diagnosis of the disease in its early stages. A glance at our textbooks shows that in the case of tuberculous infection, which is more thoroughly understood than any other, and which is responsible for so much of the misery of the lives of rich and poor, too often the site of the impact of the infection is regarded only, but the nature of the infection is not considered. To show how well founded is this charge, it is only necessary to watch the process of examination for our final examinations. Again and again a candidate will give the diagnosis of "pleurisy," and for its treatment a belladonna plaster, but little effort will be made to find out whether tuberculosis is responsible for it; again, our out-patient departments show the carelessness with regard to this diagnosis of "site" of disease without reference to "cause." A patient may be treated for months for "bronchitis," whereas a preliminary examination of the expectoration for the tubercle bacillus would have established the true nature of the malady.

The reader may consider these remarks as platitudinous; but the fact remains that, owing to the advance of hospital methods over those made use of by the ordinary practitioner, the latter is suffering, and will suffer more in the future, at the hands of those who are responsible for the more thorough methods of the hospital, and the cure is that the private doctor must make himself not a mere carping onlooker, but an active participant in advances which, though more exacting of time and knowledge, tend in the end to lessen the rôle of cases which have been bungled from the outset, and so allowed to accumulate as a residuum of incurable advanced cases.

THE HOUSING AND TOWN PLANNING BILL.

It will be gathered from the account of the Committee stage of this bill in the House of Lords given in our Parliamentary Notes that great changes have been made by the peers which will reduce the measure to comparative uselessness. The Housing Acts already on the Statute Book have utterly failed in rural districts on account of the tediousness and expense of the procedure laid down. The bill of this year sought to remedy this by introducing quicker and cheaper methods of acquiring land, of demolishing insanitary property, and of providing wholesome homes for the working classes. It may be admitted that the bureaucratic powers asked for by the Local Government Board were open to objection, but in the absence of energetic action by local authorities, stimulated by health officials secured from arbitrary dismissal for doing their duty, such central powers must be exercised if we are to have speedy housing reform. The debate was redeemed by an attempt made by the Bishop of Southwark to restore the old Clause 30, which provided for a census and register of all small house property and so ensured the publication of the names of owners of insanitary dwellings. The Archbishop of Canterbury supported the proposal; but the Government declined to accept it, and as the lay peers did not come to the bishop's aid the clause was not restored. The House of Lords has thus, we are sorry to say, checked the prospect of good housing in the near future. In its zeal for the authority of local government it has even struck out of the bill the power of the central authority to prescribe the duties of county medical officers, and rejected their right of appeal against dismissal. Its attitude to the town planning clauses of the bill has been equally disappointing from the point of view of public health. In the present temper of political parties, and with the present feeling between the two Houses of Parliament, we fear that a promising opportunity of remedying a great sanitary scandal has been seriously endangered.

FASTING PRISONERS AND COMPULSORY FEEDING.

As our readers are aware, the attention of the House of Commons was drawn to the compulsory feeding of prisoners who persistently refused food by Mr. Keir Hardie last Tuesday. Mr. Keir Hardie wished to know under what rule a female prisoner named Lee, one of the nine suffragists detained in Winson Green Prison, Birmingham, had had food "pumped "down her throat against her will." Mr. Masterman replied that although no prison rule or regulation specifically dealt with the subject, it was the duty of the prison authorities to take such steps as were necessary to prevent prisoners from committing suicide or doing themselves personal injury. He very properly added that if the prison authorities allowed any prisoner to cause his or her own death by starvation, these authorities would incur the severest censure, even if they did not lay themselves open to criminal proceedings. The method of dealing with the "hunger-strikers" by "forcible feeding" is so simple that the only cause for wonder is that it was not put in practice as soon as this cheap way of escaping the penalty of law breaking was adopted. If the prison authorities had had men to deal with it certainly would have been. To speak of it as a "dangerous outrage" and to describe it, as Mr. Keir Hardie does, as "pumping down" food, is simply grotesque. But absurd as Mr. Keir Hardie's description is, he is outdone by Mr. Snowden, who asked if "it were not a fact that the women were put "in irons during the time of the medical treat-"ment"! Lest a most unmerited odium should be aroused by these misleading suggestions it may be said that in prisons the *instrumentum et apparatus belli* is the ordinary soft red rubber oesophagal tube with funnel attached, such as is painlessly employed daily in asylums throughout the country, and such as many patients pass themselves for stomach lavage. The tube is passed into the stomach, either through the mouth or through the nose, according to circumstances, and the food, usually milk, or thin cornflour and milk, beef-tea and eggs, thereupon administered. The operation is one requiring a certain amount of dexterity and great care and gentleness, and that is all. "Forcible feeding" is the term consecrated by use, but is decidedly a misnomer, for force would cause reflex vomiting and defeat the purpose. The only force introduced into the procedure is that supplied by the persons fed, in resisting the offices of those who "must "beg and pray for leave to do them good." The operation is at first somewhat disagreeable to the person fed, but quickly becomes tolerable, and, finally, a matter of complete indifference. In the case of asylum patients who resist violently the subjects have often to be manually restrained during the process, and a mouth-opener, with the points guarded with rubber or tape, employed; but in prisons, where the persistent refusal of food is oftentimes merely in protest against the supposed iniquity of incarceration, this is not so common. In cases where compulsory feeding over prolonged periods is required, a tube of larger calibre is used, and the ordinary full diet is pounded in a mortar and strained through a moderately fine sieve, the patient being

fed as a rule twice a day. We have heard of one patient who was fed in this way for over two years, with no alteration in his bodily condition except a considerable gain in weight. Lastly, we may draw attention to the statement of Mr. Masterman with regard to the Birmingham suffragists, that artificial feeding was only employed as a last resort. Suffragettes have described this form of feeding as a brutal and dangerous outrage. That it is not dangerous is vouched for by the fact that tube-feeding is of daily occurrence throughout the asylums of the country, and for the rest the description remains either outrageous nonsense or a brutal perversion of fact.

THE SANITARY CONDITION OF GRAVESEND.

In the year 1877 Mr. Netten Radcliffe inquired into a series of complaints made to the Local Government Board by several persons resident in Gravesend with reference to the prevalence of dangerous infectious disease in the town, to certain alleged defects in its sanitary arrangements and administration, and to the existence of sundry specified nuisances. Mr. Radcliffe found that the sewage from the houses in the town, numbering nearly 4,000, was stored up for periods varying from two to thirty years in cesspools hollowed out in the porous rock upon which the houses stood, and in their immediate vicinity, each house, or group of houses, having its particular cesspool, or group of cesspools; and he very properly recommended that the town should be systematically sewered, and that the full statutory powers of the local authority should be exercised for the disuse of all cesspools. In 1885 Sir (then Mr.) Shirley Murphy inspected the town for the purpose of ascertaining what sanitary improvements had been effected in the intervening eight years, and he reported that among the insanitary conditions still existing was the system of storing vast accumulations of excremental filth in cesspools in proximity to inhabited dwellings. Eight years later, in 1893, Dr. Theodore Thomson, on behalf of the Local Government Board, met the corporation of Gravesend in conference, and made formal recommendations with regard, among other matters, to the sewerage of the town and the disposal of excrement. It is not a little startling to find after the lapse of sixteen years, in the report of Dr. R. J. Reece which has just been issued by the Board, that there is still no main sewerage scheme in Gravesend, and that the bulk of the house drainage and excremental filth is still received into cesspools varying in depth from a few feet to 60 ft. or more. They are domed over with brickwork as a rule, though some are covered with stone slabs, which in their turn are covered with earth, and in some cases their exact whereabouts is a matter for conjecture. In the last eight years there appear to have been no fewer than 550 new cesspools added to those previously existing in the town. They are all emptied at the expense of the rates, the total cost averaging about £2,000 yearly. It may readily be conceived that an authority which could allow such unsatisfactory conditions to continue after having their attention so frequently called to them would be lax in many other directions. Such indeed is the case, for Dr. Reece reports that although by-laws with respect to slaughterhouses have been in force in the town since 1893, and regulations under the Dairies, Cowsheds, and Milkshops Orders since 1899, that neither in the one case nor the other are they enforced. Of the thirteen slaughterhouses he says that not one, either from its position, construction, or condition is fit for the slaughtering of animals for the food of man. Indeed, the entire report is a continuous record of ineptitude on the part of the Gravesend corporation, and in reading it it is difficult to believe that it can refer to conditions existing at the present day.

LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

On September 27th, at the Liverpool Club, Moorfields, Sir Alfred L. Jones, President of the Liverpool School of Tropical Medicine, entertained at luncheon Sir William M'Gregor, who sails on October 15th to take up his new duties as Governor of Queensland. Sir William M'Gregor said he had spent thirty-one years in the service of the Sovereign in the tropics, and he thought that few people had had a better opportunity than he had of seeing how much an institution of this kind was wanted in the world. He had had the opportunity of renewing his studies at the school, and what he had been able to learn had been of considerable use to him and would be of great value to others. It was a great school, not on account of its size, but because it was the nucleus from which were to develop tropical schools all over the empire. The two greatest events that he had assisted at during the sixty-one years he had spent on this earth were, in his opinion, the introduction of antiseptic surgery by Lord Lister, who was his first teacher in surgery, and, to put it briefly, the propagation amongst men of the knowledge and science of the Ross cycle. The outcome of that cycle was an extension of knowledge more or less of the same kind that embraced other diseases than malaria. Sir Alfred Jones congratulated Sir William M'Gregor heartily upon going to Queensland. They were glad to think that he was to be accompanied by one of the experts from the Liverpool School, Dr. Anton Breinl. He thought that Liverpool men would help to make the world very much more healthy than it was, and a great deal of that credit was due to Professors Ross and Boyce. Sir William had had a remarkable career. He was the only Governor who had visited the Eskimos in their lair, and in West Africa no man had been more active; and, speaking from personal knowledge of the people who traded with that country, Sir Alfred Jones could say they owed him a deep debt of gratitude for the way in which he benefited that territory. In regard to cotton growing, much of the development in that country was due to Sir William and men of his class, and the great improvement in its health was also largely due to him. Major Ross remarked that Sir William M'Gregor was the first Governor in British possessions to deal with malarial fever in a rational and scientific manner. In 1900 Sir William attacked malaria in Lagos by every method possible with the money that he had. He began to drain those dreadful marshes round Government House, and they had now been informed that that house was mosquito-free. That was one other result of Sir William's work. Unfortunately, his health failed, or he would have certainly taken a leading part throughout the British dominions in that important work. In Liverpool they particularly wanted him to be appointed Sanitary Commissioner under the Colonial Office, so that he might go from colony to colony, but his health failing at Lagos he went to Newfoundland. He was now going to Queensland, and the first thing that would be done was to open a laboratory in their own special work, with Dr. Breinl at its head. In Australia he would have great facility for dealing with disease. He (Major Ross) did not claim to have begun this tropical work; Sir Patrick Manson took the initial step, and Sir Alfred Jones was the first to open a tropical school. Dr. Breinl said he could assure them that, as the director of the Tropical School in Queensland, he would do his utmost to carry on in Australia the work which the Liverpool school had carried on in

other parts of the Empire. Gratifying was it to him to know that he was going to have the help not only of the Governor, but also of the Government of Queensland.

THE CARDIFF MEDICAL SCHOOL.

The allocation by the Treasury of £1,500 a year to the Cardiff School of Medicine came as pleasant and most unexpected news to most of those connected with the school. In spite of Sir Donald MacAlister's note upon the Faculty of Medicine in the University College, Cardiff, published in the recent report of the Committee on the University of Wales and the Welsh University Colleges, few imagined that the committee would second his praise in such a practical manner. It may not be superfluous to give, in a very few words, the history of the Cardiff Medical School. It was started less than twenty years ago, chiefly through the enterprise and energy of Dr. Edwards of Cardiff. By founding two chairs, one of anatomy and the other of physiology, and by the foundation of a lectureship of materia medica, all of which were attached to the Cardiff and Monmouthshire University College, in which institution chemistry, physics, botany and zoology were already taught, students of medicine were enabled to spend at least three out of their five years at Cardiff. The wisdom of this step has since been amply justified, both by the number of students attending the school and by the high quality of the examinations for which they have presented themselves. The school has grown in numbers, and, for the last two or three years, the entries have been higher than those in most London or provincial schools of medicine. Moreover, by far the greater number of the Cardiff medical students prepare for the degree in medicine of the London University. The school, therefore, claims consideration not alone because of its numbers, but also because of the quality of its students. This fact has been recognized, and the University of Wales has appointed a medical board whose chief work has been the drawing up of regulations for the Welsh M.B., B.Ch., under the able guidance of Sir Isambard Owen. The Cardiff Infirmary has at the same time been advancing by leaps and bounds. It has an excellent staff of surgeons and physicians, and is in most respects up to date; and in two years' time, when its new wing is built, it will be fitted to accommodate students who wish to spend all their five years of study in Cardiff. Cardiff possesses also a fever hospital, and an asylum within a tram drive of the infirmary. The town is therefore actively preparing for the possession of a complete school of medicine in its midst. There are, however, many steps to be taken before this complete school can become an accomplished fact, and the grant of money from the Treasury must at least be doubled by local effort if Cardiff is to have a complete school, for at the least £3,000 a year is required for the purpose. For it will be necessary to build two entirely fresh laboratories, one of pathology and the other of pharmacology. Colonel Bruce-Vaughan, one of the most efficient administrators, was able to announce to the Cardiff Infirmary Board of Management on September 15th that within a year the infirmary will possess a Pathological Department which will be quite up to date. It will include a lecture theatre, practical rooms for students, and rooms for research. It will be built and equipped for £4,600. This is another windfall for the medical school, whose members are unanimous in their appreciation of this magnanimous gift. In respect to pharmacology laboratory accommodation is specially required, for there is a paragraph in the rules and regulations for the taking of a Welsh M.B. to the effect that the course in pharmacology shall include one term of lectures, accompanied by laboratory work, including work on the physiological action of drugs. This will mean the services of a trained pharmacologist, acting as an assistant lecturer, to begin with. The college authorities will not only have to pay these teachers, but will also require to keep up the annual expenditure of their departments. The existing departments of anatomy and physiology require to be placed upon a proper footing, and there is a second demonstrator required in anatomy, another teacher in histology and embryology, as well as one in organic chemistry and chemical physiology, and these necessary changes will swallow up at least the £1,500 already granted. A further sum yielding another £1,500 a year at the very least will be required for the new chairs of medicine and surgery and other branches of the healing art. It is earnestly to be hoped that the people of Cardiff will generously support this great undertaking by endowing the necessary new chairs. The sum of £1,500 a year voted by the Treasury requires to be supplemented by an equal sum.

THE PATHOLOGY OF THE TRAMP.

The now extensive literature dealing with what the French call "fugues" and vagabondage has received a valuable addition by the publication of the *Fugues and Vagabondage* of Professor Joffroy and Dr. Dupouy,[1] whose appearance in print Professor Joffroy was fated not to see. Up to now "fugues" have been considered mostly in relation to epilepsy and hysteria; doubtless because in these disorders they are at once most common and most striking. They nevertheless occur in many other forms of mental disorder—for example, in mania, melancholia and dementia, and also in imbeciles and degenerates. In collecting and classifying all the varieties of "fugues," therefore, and further in relating them to the kindred forms of pathological vagabondage, the authors have filled an important lacuna. By "fugue" the authors mean something more than the usually accepted variety of ambulatory automatism followed by amnesia, and define it broadly as an impulsive desertion of the domicile, either with or without conservation of consciousness and memory. Similarly, they define vagabondage as "the fact of wandering without the "power or the will to return to a fixed domicile." That is, that fugues and vagabondage are symptomatic, like all other morbid impulsions, of alterations in volitional power. Therefore, after defining the will, not as a physiological or psychological entity, but as the resultant of multiple factors—inborn ancestral and atavistic instincts, spontaneously acquired tendencies, in a word, the total elements composing personality—they pass under review the various modalities of what may be termed conative pathology. If the course of normal psychic life, they say, could be represented diagrammatically, it would appear as the regular curve of the superior activity called volitional; beginning from zero with the newborn, gradually attaining its maximum in the adult, and ending only with death after a gentle period of senile involution. In describing the pathological alterations of this normal curve, therefore, of which fugues—in their extended meaning—are common features, they begin with the romantic fugues of childhood, and then proceed to the study of the same phenomena in idiots, in whom they are rare, and in imbeciles and the debilitated, in whom they are very common. Many writers have commented on the frequency of periodic fluctuations of emotional tone and intellectual

[1] *Fugues et vagabondage: Etude clinique et psychologique.* By (the late) Professor A. Joffroy and Dr. R. Dupouy. With preface by Dr. G. Deny. Paris: Félix Alcan. 1909. (Med. 8vo pp. 378. Fr. 7.)

ability in feeble-minded persons and degenerates, and have considered these to be epileptic in nature—that is, forms of masked epilepsy. Parenthetically, it may be recalled that Aschaffenburg considers that periodic fluctuations in emotional tone constitute the most pathognomonic feature of epilepsy, and not convulsions. Many of these attacks are accompanied by fugues, or by other grouped phenomena of identical origin—obnubilation of consciousness, reasonless excitement, or depression, and powerful impulses to escape or break through the restrictions of their position, followed by partial or complete amnesia. Some of the cases described by the authors under the *fugues du déséquilibré* recall such cases, and would doubtless be considered by some to be epileptic in nature, though the authors, in the absence of epileptic fits, rule out this diagnosis. The authors then proceed to describe a form of obsession under the term *fugue dromomaniaque*. Here the fugue or flight is the result of a true obsession—that is, is due to the idea of wandering imposing itself irresistibly upon the mind, defying the will of the subject, who on account of this is emotionally disturbed at the same time that he recognizes the idea as foreign and absurd. There is no loss of consciousness, and therefore no subsequent amnesia. When the subject gives way to the dromomaniac impulse he wanders, inexorably impelled by this parasitic Old Man of the Sea, till the impulse exhausts itself, when he returns exhausted, penniless, and repentant to his family. True dromomaniacs declare that they feel a doubling of their personality; but this, the authors say, is illusory and does not correspond to the actual dissociations of personality found in hysterical cases, which they next describe. Hysterical fugues have been so frequently described that the detailed analysis and interesting examples from the Asylum of St. Anne given in the chapter dealing with these flights may be passed over here. The succeeding chapter on "ambulatory paranoia," however, though brief, is arresting. Here the authors discuss the great group of instinctive tramps, homeless beggars by choice, idlers who pick up a living but never earn one, true vagabonds who would rather starve under the blue lift of Heaven than work in a palace. It is impossible to deny a lurking sympathy for these picturesque nomads of the *grand' route*, the truly rich, who, as Richepin sings,

> Possédant ce qui n'est à personne: la friche
> Déserte, les étangs endormis, les halliers
> Où lui parlent tout bas des esprits familiers,
> La lande au sol de miel, la ravine sauvage,
> Et les chansons du vent, dans les joncs du rivage,
> Et le soleil, et l'ombre, les fleurs, et les eaux,
> Et toutes le forêts avec tous leurs oiseaux!

Most writers have explained the inextinguishable love of freedom and the hatred of the yoke of settled employment of these people by assuming in them ancestral instincts and by regarding their vagabondage as an atavistic phenomenon, an hereditary archaism of ethnological rather them of pathological significance. The glamour of this romantic history vanishes, however, under the cold scrutiny of Professor Joffroy and Dr. Dupouy. For them the vagabond is a "psycho-path," ego-centric, "autophile," extrasocial, often antisocial; in a word, a paranoiac! After this the authors consider the fugues of excited, depressed, delusional demented, and confusional states, and, lastly, there is a valuable chapter on ambulatory automatism. Enough has been said to demonstrate the value of a work which collects and collates the different forms of fugues and vagabondage, and explains their mechanism on the basis of volitional disorder or defect.

THE RESULTS OF CATARACT EXTRACTION.

SOME of the results of cataract extraction are so brilliant, that we are all apt to adopt a too optimistic attitude when discussing the probabilities of good vision with patients who are about to submit to the operation. Golesceano contributes an article to the *Recueil d'ophtalmologie* for June, 1909, which should lead us to adopt a more cautious attitude. The author analyses the results of his last 100 extractions, with the following final results: Perfect vision ($\frac{6}{6}$) not one case; $\frac{6}{9}$, 3 cases only; $\frac{6}{12}$, 13 cases; $\frac{6}{15}$, 11 cases; $\frac{6}{24}$, 11 cases; $\frac{6}{30}$, 5 cases; $\frac{6}{36}$, 11 cases; $\frac{6}{48}$, 15 cases; $\frac{6}{60}$, 11 cases; less than $\frac{6}{60}$, 9 cases, 4 of whom only possessed perception of light in the eye operated upon. If we regard any acuity over $\frac{6}{60}$ as a good result—a low enough estimate—we get a percentage of about 60 per cent. of good results. These statistics are not nearly so good as some published by the German clinics—as, for example, Basle—but even these latter figures teach that the final result of a cataract extraction, performed under the very best conditions, is not always a good one, and is often very bad. Even when the first result is almost perfect, the vision may deteriorate later from choroiditis or optic atrophy. The lens is not only a refractive medium, it has a bio-physiological function as well, and its extraction may unfavourably modify the metabolism of the eye.

AT the Leprosy Conference recently held at Bergen, it was decided that the next meeting should be held at Serajewo in 1917.

THE members of the Section of Orthopaedic Surgery of the International Medical Congress recently held at Budapest have decided to form an international orthopaedic society. Professor Dollinger is president of the Organizing Committee.

WE regret to announce the death of Dr. John Milson Rhodes, of Didsbury, Manchester, which occurred on Saturday, September 25th, at the age 62. Dr. Rhodes was one of the leaders in the movement which led to the establishment of the Association of Poor Law Unions in England and Wales. We hope to publish a full obituary notice of his career in the next issue of the JOURNAL.

THE third Congress of French Medical Practitioners will be held in Paris next Easter. Among the questions proposed for discussion are the following: Unqualified practice, friendly societies and the free choice of doctors, hospitals for the indigent, administrative structure of hospitals, the raising of the scale of medical fees, the application of the law as to public health.

WE are requested to state that the Royal Colleges of Physicians and Surgeons, having disposed of the Examination Hall on the Victoria Embankment to the Institution of Electrical Engineers, have now secured a site for a new Examination Hall in Queen Square, Bloomsbury. As already stated in the JOURNAL, this building will probably take two and a half years to erect. In the meantime the Royal Colleges have made arrangements with the Institution of Electrical Engineers to occupy a considerable amount of space in the present Examination Hall building for the conduct of the examinations. The entrance to the office, under the new arrangement, is on the west side of the building facing the Savoy Hotel.

Medical Notes in Parliament.

[From our Lobby Correspondent.]

The Housing Bill.—The Committee stage in the Lords last week resulted in many amendments being made. On Clause 15, on the motion of Lord Clifford of Chudleigh, the time given to the landlord to execute repairs was extended on a compromise to twenty-one days, and it was made compulsory on the local authority to specify the necessary repairs. A new subsection was then carried, after some discussion, giving the landlord power to meet an order for repairs by closing the tenement instead of repairing it. Lord Salisbury then moved to provide that the appeal made by the landlord under the clause should be to the county court judge, not to the Local Government Board. The Lord Chancellor opposed the amendment as needless and expensive. Lords Camperdown, Alverstone, and Halsbury supported it; and after an appeal by Lord Crewe against going to law to settle so small a matter as the repairs of a cottage, the amendment was carried by 119 to 31. On the next clause a similar change was made; and then on Clause 17, which deals with closing orders, the minimum period given the tenant to quit a bad house was extended to fourteen days, and the expenses of removal it was agreed should not be paid for him if the bad condition of the house was due to the tenant. On the motion of Lord St. Aldwyn, the regulations in the bill as regards sleeping places were omitted, and only general powers given to the local authority. On Clause 23 coming under consideration, the Duke of Northumberland secured the omission of paragraph (*f*), and then Lord Camperdown obtained the omission of Clause 24, which dealt with improvement schemes. Lord Belper next objected to Clause 25 which provided for local authorities carrying out the works of an improvement scheme themselves. Others objected to the clause as encouraging municipal trading, and the clause was struck out. After Clause 30 had been passed the Bishop of Southwark made an earnest attempt to restore the old census clause to the bill which ordered a register to be made of all small dwelling houses, and argued for it as a means of exposing the owners of insanitary property. The Archbishop of Canterbury also supported this view, but Lord Crewe and Lord Beauchamp opposed on behalf of the Government, and the new clause was negatived. Other clauses up to 44 were passed with some slight amendments. Clause 45 was altered on the motion of Lord St. Aldwyn by exempting from acquisition land belonging to local authorities, railways and other public undertakings, after Lord Beauchamp had pointed out that the amendment made a serious change. Lord Camperdown next moved a new clause defining the working classes and putting in a wage limit of 30s. a week. After considerable discussion this clause was carried against the Government by 83 to 37. The remaining clauses up to the Town Planning Section of the bill were passed with some small amendments. On Clause 54 dealing with the preparation and approval of town planning schemes, Lord Cawdor objected to the procedure under this part of the bill, and condemned the excessive powers given to the Local Government Board to interfere with local authorities. What had become of the great confidence of the Liberal Party in local authorities? There was an absolute and direct interference in a most undesirable and unfair way. He moved the omission of Subsections 4, 5, and 6 of the clause. Lord Beauchamp defended the clause, and said the Government were prepared to make concessions, but it seemed that they would be useless. Lord Cawdor's scheme would involve great delay, and would be most hurtful. Lord Onslow said there was no objection to town planning schemes, it was only where a scheme was opposed to or interfered with a statutory enactment that a provisional enactment would be required, and the delay would be two years at the outside. The large interests involved should have the opportunity of appearing before a committee if they desired. Lord Cromer thought people interested should not be left at the mercy of the Local Government Board. He hoped a stand would be made against giving large powers of control to Government departments. Lord Crewe expressed his deep disappointment at the attitude of noble lords opposite, and said the difference between them and the Government was unbridgeable. He regarded the amendments as likely to destroy the usefulness of the measure. Lord Lansdowne replied, and the amendments were carried by 73 to 31. Other changes were made, and a new clause, embodying Lord Cawdor's view, was added to the bill. The other provisions with reference to town planning were discussed, and many of them amended, Clause 58 being altered so as to require arbitration for settling questions arising under this section. On Clause 61, the London County Council and the councils of county boroughs were exempted from the operation of the Act, in spite of the protest of the Government. The clause dealing with the appointment of county medical officers was altered, on the motion of Lord Belper, by the omission of the power given to the Local Government Board to prescribe their duties, as unnecessary and contrary to the principles of local government. Lords Crewe and Beauchamp defended the provisions of the bill as useful for obtaining a minimum standard of efficiency, but the amendment was made. In the same way Subsection 5, which made the county medical officer removable only with the consent of the Local Government Board, was struck out, on the motion of Lord Belper, supported by the Duke of Northumberland and Lord Lansdowne. An amendment to relax the provision as regards practice by a county medical officer was withdrawn, and the clause as amended passed. The remaining clauses and schedules were agreed to with some amendments, and the bill ordered to be reported for consideration on Monday, October 4th.

Feeding Suffragettes in Prison.—Mr. Keir Hardie raised the question on Monday of the artificial feeding of the Suffragettes who refused to take food, and Mr. Masterman said that the medical officer of Birmingham Prison reported that certain women prisoners had persistently refused to take food. The Prison Commissioners therefore, with the approval of the Home Secretary, instructed the medical officer to apply such ordinary medical treatment as was, in his opinion, necessary to prevent the risk of their committing suicide by starvation. In answer to other questions, he said the authority under which action was taken was the general responsibility of the Prison Commissioners to the Home Office. It was the duty of those in charge to prevent prisoners committing suicide. The treatment was the ordinary hospital treatment in such cases, and the ordinary treatment which was frequently applied to men and women—to contumacious or weak-minded persons. Nine women altogether were in a condition which necessitated this treatment for their health. He rather gathered that some of them at least found no necessity to persist in their resistance to food, and that the full hospital treatment was only done in the case of one of the nine. In answer to a question whether the full treatment meant pumping food through the nostrils or by a tube down the throat, Mr. Masterman said he thought the ordinary method was the second one. On which Mr. Keir Hardie described it as a "horrible outrage." On Tuesday Mr. Keir Hardie again questioned the Under Secretary, and Mr. Masterman said that the Secretary of State had received a report that morning from the Governor of Birmingham Prison to the effect that six of the Suffragist prisoners were still under special medical treatment, and that in consequence of the treatment the condition of health of these prisoners showed progressive improvement. No prison rule or regulation dealt specifically with this subject. It was the duty of the prison authorities to take such steps as were necessary to prevent prisoners from committing suicide or doing themselves personal injury.

If they allowed any of their prisoners to cause their own death by starvation they would incur the gravest censure, if indeed they did not lay themselves open to criminal proceedings. In previous similar cases of this kind the prison authorities had always recognized their duty. In answer to a further question whether six of these women were still fed by the stomach pump, Mr. Masterman said that his information was that there were various means of persuading these women to take nourishment, and only in the last resort was the ordinary hospital instrument used. He believed that was only done in three cases.

The Spirit Duties and Drugs.—On Clause 61 of the Finance Bill, Sir W. Bull moved an amendment to remove the proposed additional duty off spirits intended for medical purposes. He had been informed that these extra duties would cost the London hospitals alone £50,000 a year. Mr. Hobhouse said there were practical difficulties in the way of the acceptance of the amendment. If those spirits were given duty free to chemists or hospitals it would be impossible for the Customs and Excise authorities to control their subsequent use, such as their illegal sale to public-houses. Mr. Austen Chamberlain and Mr. Lyulph Stanley supported the amendment, and Mr. Fell said that there would be an increase of about 37 per cent. in the amount of the tax on certain drugs, and that would deal a heavy blow to hospitals and dispensaries. The Committee divided, and the amendment was rejected by 159 to 84.

Motor Car Licences.—When Clause 66 of the Finance Bill came up for discussion in the Commons on Friday last, Subsection (4), which is as follows: "(4) If a duly qualified medical practitioner proves to the satisfaction of the Commissioners or council by whom the licence is granted that any motor car kept by him is kept for the purpose of his profession, he shall be entitled to an allowance in respect of the duty payable under this section on the car equal to half the amount of duty so payable," Mr. Hunt moved to insert the words "or veterinary surgeon" after medical practitioner, urging that this class had a claim for exemption on humanitarian grounds only second to that of doctors. The Chancellor of the Exchequer could not see his way to accept the amendment. The moment he began to extend the exemptions there was a difficulty in drawing a line. In the case of doctors there was everything to be said in favour of encouraging the use of motor cars, but considerable difficulty would arise with an extension of the abatement. The amendment was supported by Mr. G. D. Faber, Captain Craig, Mr. Essex, Mr. Gretton, and Mr. A. S. Wilson. The Committee divided, and there voted for the amendment 61, against 156; majority against 95.

Soldiers' Defective Teeth.—Mr. W. Thorne asked whether the eleven soldiers who were discharged during the week ending September 19th, 1909, at Colchester, on account of bad teeth, were discharged from the army entirely, or only discharged from the colours to the first-class Army Reserve. Mr. Acland said that the thirteen men of the 8th Hussars, who were under orders for service in India, were rejected as medically unfit on account of defective teeth. The sum of £1 per head was granted for dental treatment of men with defective teeth, but as the cost of such treatment was assessed at a larger sum for these men, they were given the option of paying the extra amount required to make their teeth sound or of being discharged as medically unfit for further service. Three men elected the former course and ten the latter. In answer to further questions, Mr. Acland said the men were discharged as medically unfit. The military authorities attached great importance to soundness of teeth, particularly when men were going on foreign service. If a man could not get his teeth made sound, it was very much better, especially considering the large number of suitable recruits coming forward at present, not to retain him. It was true they had lost the services of eleven men for the sake of £33, but they did not think it justifiable, considering the other expenses, to pay more than £1 towards the expenses of putting a man's teeth right. If the teeth were so bad that the expenditure of that sum would not put them right they preferred to dispense with the man's services.

The Tuberculosis Prevention (Ireland) Act.—Last week, in answer to Mr. Farrell, Mr. Birrell stated that under Part I of the Tuberculosis (Ireland) Act, the Local Government Board had made (*a*) The Tuberculosis (Conditions of Notification, (Ireland) Order, 1909, and (*b*) The Tuberculosis Regulations (Ireland) Order, 1909. These Orders were issued in June last to all local authorities and medical officers in Ireland, together with a Memorandum explanatory of the objects and provisions of the Act. Copies of these documents had been furnished to any persons who had applied for them, and the Board had made arrangements for placing them on sale as Stationery Office publications.

Vaccination Notices, Lambeth.—Mr. John Ward asked the President of the Local Government Board whether he was aware that the Lambeth vaccination officer did not serve Form Q on Mr. Silvey, Lambeth, reminding him of the date on which the four months from the birth of his child expired, during which period he could have declared his conscientious objection to vaccination; and whether, in view of this fact, he would notify the officer not to prosecute Mr. Silvey for the non-vaccination of his child after it attained the age of 6 months. Mr. Burns said that he understood the facts were as stated in the question. The fact that he did not receive Form Q did not relieve the parent from liability to proceedings for not having his child vaccinated. It rested with the vaccination officer to determine in the circumstances what action he would take.

Military Assistant Surgeons (India).—Mr. Hazleton asked the Under Secretary of State for India whether any positions as military assistant surgeons in India were open to Indians; whether the salaries of these positions were higher than those of civil assistant surgeons who were chiefly Indians; and whether it was proposed to remove the disqualification in the way of competent Indians entering all the ranks of the medical service of their country. The Master of Elibank said that the answer to the first question was in the negative, military assistant surgeons being recruited primarily for service in European military hospitals. The answer to the second question was in the affirmative, but the difference in rates of pay was not very considerable, being confined to the highest grades. The Secretary of State would consult the Government of India as to the advisability of some revision of the constitution of this branch of their medical services.

The Mortality in Transvaal Mines.—Last week Colonel Seely gave the following statement: The general statistics of mortality furnished to the Secretary of State were for periods of three months, and the figures for the three months ending on June 30th, 1909, had not yet been received. The figures for the quarters ending March 31st, 1907, 1908, 1909, respectively, were as follows:

		Whites.	Chinese.	African Natives.
Average number employed	1907	19,350	53,738	130,351
	1908	19,193	28,797	160,696
	1909	21,814	10,527	196,674
Mortality per 1,000 per annum from all causes	1907	20.051	16.375	31.361
	1908	19.590	15.696	30.616
	1909	18.336	15.959	35.408

Ireland.

[From Our Special Correspondents.]

Annual Report of Irish Local Government Board.

By the courtesy of the Vice-President of the Irish Local Government Board we have received a copy of its report to the Lord Lieutenant for the year ending March 31st, 1909. It is a narrative of the efforts of three Irish gentlemen to induce the local councils to carry out the law of the land; as the Irish peasant is a clever obstructionist, their efforts have not been always successful.

Maintenance of Roads.

The first subject dealt with is the maintenance of the roads, a subject of unusual interest to the Irish medical practitioner. Every assistance and encouragement possible is given to the local councils to improve the highways, with, for the most part, little success. They can obtain money at a low rate of interest for the purchase of road-rolling machinery, and they can obtain loans, repayable in five years, for the repair of the roads at equally low rates, yet the majority of them will not borrow the money for either. In some parts of Ireland, where the labouring class has the preponderance of vote, direct labour schemes have been adopted, and, where there is a good county surveyor, this is no doubt the best plan, but in most counties the peasant farmers are in the majority, and they regard the contract system as most profitable for themselves and their friends, and are most hostile to the introduction of machinery. The result is that the Irish roads are still the worst in the kingdom, and, we fear, are long likely to remain so under the present system of administration. Diminution in the cost of upkeep does not appeal to the people who make a profit out of the present inefficient and most wasteful practice.

Boarded-out Children.

As in former years, the reports of the two lady inspectors of boarded-out children are most instructive; but we regret to observe a note of pessimism throughout them, and can well understand it. These ladies began their work with enthusiasm and have carried it out with great assiduity, but they find little encouragement to be got from boards of guardians. They complain that many boards of guardians seem to regard the boarding-out system as an easy and cheap means of shifting their responsibility for the care of these little children, and take little care in the selection of the foster parents and less in the subsequent treatment of the children. We observe that the number of children boarded out in 1908 was 2,787, a small increase on the previous year; and the cost of their maintenance was £17,912, which works out at £7 per child per annum. As the average cost per week of indoor maintenance in workhouse is 4s. 5½d., there is a saving of nearly £5 per head on boarded-out children; so it is small wonder the lady inspectors are continually complaining that these children are badly clad, badly housed, and not infrequently badly fed. But they bear testimony to the attention paid to those poor children by many of the Roman Catholic clergy, to which faith most of the children belong. We fear, however, there is no hope of improvement under the existing Poor Law.

District Midwives.

The Local Government Board deserves the greatest credit for the way it has urged boards of guardians to appoint district midwives, generally in the face of strong opposition. A few years ago there were no district midwives under the Board, and now, out of 741 dispensary districts, only 51 are still unsupplied. We trust the Board will extend its good work by soon requiring a qualification in general nursing, for as midwives these women have not in rural districts much work to do, and women competent, like the Jubilee Nurses, to undertake the nursing of the poor are badly needed. The labourers and small farmers are, in sickness, dependent upon ignorant relatives for nursing in the most acute ailments, not infrequently with the most disastrous consequences, and the lack of trained nurses often renders the efforts of the doctor futile.

Typhus Fever.

Only 162 cases of typhus fever were reported during the year, as against 194 in the previous year. The greatest outbreak occurred not in the western unions where it is supposed to be endemic, but in the midland County of Cavan where an outbreak occurred also the previous year. Both were attributed by Dr. Brandon McCarthy, the inspector, to the sale of clothes from infected houses. We believe none of the unions in which it occurred have been prevailed upon to erect disinfecting chambers, and the people prefer to sell infected clothing to dealers rather than have it destroyed.

Dispensary Doctors.

Up to March 31st, 64 unions out of 149 into which Ireland is divided had adopted graded scales of salaries for their medical officers, the initial salary starting in most cases at £120, and increasing to £180, or £200 after twenty-five years' service. Of the unions adopting the graded scales there are 28 in the Province of Munster, 24 in Leinster, 6 in Connaught, and 6 in Ulster out of 43 unions in that province.

There is the excuse of poverty in Connaught, but none such exists in Ulster, where we believe the salaries are lower than in any other part of Ireland. The Ulster unions which have adopted graded scales are Belfast, Newtownards, Banbridge, Ballycastle, Coleraine, and Bailieboro', and we trust the other 37 unions are proud of their parsimony.

Since the return under review was published we understand the union of Westport, in Connaught, has fallen into line, but we very much fear the dispensary doctors of Ulster will have to await justice at the hands of a new Poor Law authority.

The report does not contain much anent the new bill for the prevention of tuberculosis, as it only came into force on July 31st, but a small decrease is noted in the percentage of deaths.

As regards other statistics dealt with in the report we observe that the total number of new cases attended by dispensary doctors has increased by over 3,000 in the past year, and that their salaries and emoluments were increased, owing to the adoption of graded scales, by over £3,500 per annum. The number treated in workhouse hospitals remains about the same as it has been for some years, but the number of inmates of workhouses shows a steady increase largely due to the increased number of tramps admitted.

Scotland.

[From Our Special Correspondents.]

Glasgow.

Medical School Extension.

The draft provisional order to extend and vary the deeds of foundation of the clinical chairs of Medicine and Surgery in connexion with the proposed transference of these chairs to the Royal Infirmary, has now been passed by the court, and has been sent to the General Council for approval. The duties of the chairs are extended to include both clinical and systematic tuition to students, irrespective of sex. Additional funds have been offered by the Muirhead Trustees and by the St. Mungo Trustees to raise the emoluments of each chair to £500, and sanction is sought to call the chair of clinical medicine the Muirhead Chair of Medicine, and the chair of clinical surgery the St. Mungo Chair of Surgery. The electing bodies are to consist of ten members. For the Medicine chair six are to be nominated by the University Court, two by the managers of the Royal Infirmary, and two by the Muirhead Trustees. The electing board for the Surgery chair is to consist of six members nominated by the University Court and four members nominated by the managers of the Royal Infirmary.

EDINBURGH.

Honour for Dr. Gibson.

Dr. George A. Gibson, Physician to the Edinburgh Royal Infirmary, has been offered the Doctorate of Science (D.Sc.) of Harvard University, U.S.A., and he has sailed for America to receive the honour at the hands of the university.

England and Wales.

[From Our Special Correspondents.]

WALES.

PONTYPOOL WATER SUPPLY.

At the monthly meeting of the Pontypool Urban District Council, held on September 22nd, the medical officer, Dr. S. B. Mason, reported 6 births and 13 deaths during the month, equivalent to rates of 11.2 and 24.3 per 1,000 of the population. Diarrhoea and gastric disturbances had led him to have tested a sample of the water supplied by the Gas and Water Company, and the public analyst reported that organisms of the *coli* group were present in 10 c.cm. There were also distinct evidences of animal matter, and owing to the presence of the *coli*-like organisms he considered it probably pointed to inefficient filtration. That was a very serious matter, and might be the thin edge of the wedge towards another typhoid epidemic. He advised the inhabitants to boil all drinking water. It was proposed by a member that a general conference of the public men of the parish of Trevethin, including Abersychan and Pontypool, on the question of the desirability of amalgamating the districts. They were beset by many difficulties on account of the limited area of the urban district, and the problems they would have to solve in the near future included a fever hospital, cemetery, and refuse destructor. The matter was referred to the General Purposes Committee.

WATER PROBLEM.

The Monmouthshire County Council, as well as a number of local authorities in that county, have from time to time promoted various water schemes, but, so far, the several efforts have been more or less in vain. Some of the local authorities have made temporary arrangements. The Abertillery, Abercarn, and Risca authorities have had the question under consideration. Abertillery already possesses a reservoir capable of storing 40 million gallons, but this, it is feared, is seriously interfered with by various subsidences. Abercarn is more seriously situated, for the district, which is rapidly increasing in population, is mainly dependent on mountain springs, and these are gradually diminishing as mining development takes place. The Risca Council has recently acquired the waterworks of the Western Valleys Gas and Water Company, but here again the supply is not sufficient for the demand, and as the population of the Risca area is increasing at a greater rate than at either of the other districts, the position has become serious. It was with these facts before them that representatives of the local authorities mentioned met to consider the general position. After a number of meetings they decided that Mr. Baldwin Latham should advise them, and he has now presented his report, in which he recommends the formation of a water board for the Western Valleys. He has submitted a number of schemes with the source of supply in the Grwyne Valley in Breconshire. A modified scheme shows the cost of constructing one reservoir in the Grwyne Valley at £250,000. This reservoir will have a capacity of 315 million gallons, and will supply 1½ million gallons per day, and will provide compensation water at the rate of three-quarters of a million gallons per day. The site is at an altitude of 1,650 ft., which will give ample pressure to supply the highest points in the district connected with the scheme. It is proposed by the scheme to take over the whole of the existing liabilities of the three authorities interested, namely: Abertillery, £59,801; Risca, £30,000; and Abercarn, £8,108. It is also proposed to obtain Parliamentary powers for supplying water to other local authorities. A meeting will be held in a week's time further to consider the question.

GOWERTON SEWERAGE LOAN.

Mr. H. A. Reed on September 21st conducted a Local Government Board inquiry at Gowerton into the application of the Swansea Rural District Council for sanction to borrow £3,900 for the purpose of completing the sewerage of Gowerton. The clerk to the council furnished particulars of the proposed loan, and the surveyor produced plans of the complete sewerage of the district. Dr. W. Williams, county medical officer of health, emphasized the urgent necessity of the drainage of the village, and Dr. Trafford Mitchell, medical officer for the district council, stated that there had been many cases of typhoid fever and other infectious diseases. Mr. D. R. Thomas, sanitary inspector, said there were 110 houses without drains. No opposition was offered, and Mr. Reed afterwards went round the district on a tour of inspection.

EBBW VALE HOUSE FAMINE.

On September 22nd Mr. H. A. Reed, M.Inst.C.E., an inspector of the Local Government Board, held an inquiry at the Ebbw Vale Council offices into the application of the District Council for powers to borrow £10,880 under Part III Housing of the Working Classes Act 1890, for the provision of dwellings at Tothill Street, Ebbw Vale. The clerk to the council stated that it was intended to erect sixty-four houses at a cost of £170 each. In 1903 the council made a similar application, when the Ebbw Vale Company opposed, and the Local Government Board refused to sanction the loan on the grounds that the proposed site was not suitable. The Ebbw Vale Company did not oppose the present application. There were several houses in the district which the council would like to close, but could not see its way clear to do so unless there were houses for the people to go to. There was not a single vacant house in the district, while several of them were occupied by two or more families. The surveyor said the site was a very suitable one. The total area of the ground would be 8,514 superficial yards, the average area of each house would be 133 square yards. The average rateable value of similar properties in the district was £9. Each house would be provided with a scullery, in which would be fixed a bath with a wooden cover that could be used as a table. The estimated rental would be 6s. 3d. a week. The chairman of the council said that there was considerable overcrowding in the district. Dr. J. W. Davies, Medical Officer of Health, said 140 houses reported upon as being unfit for human habitation could not be closed as the inmates could not get other houses. The chairman of the Finance Committee said that the class of houses erected by building clubs were not suitable for working men. He was a trustee of a building club, but was in favour of the application.

CARDIFF HEALTH COMMITTEE.

At a meeting of the Cardiff Health Committee held on September 21st, attention was directed to certain houses in the docks district at which there was reason to believe sailors were lodged, such houses not being duly licensed. The officers of the local authority, however, had no power of entry unless they had direct information that there were sailors there. It was resolved that the medical officer of health be instructed to report upon the advisability of getting the Board of Trade to insert a clause in the by-laws giving the health officials of the city greater powers of entry. Dr. Walford, medical officer of health, presented to the committee a report upon the injurious effects of road dust, in which he stated that while it was impossible to provide actual figures, there was no doubt that the increase of road dust during the hot, dry weather, was responsible to some extent for the higher death-rate. The rate of infant mortality and the diarrhoeal death-rate were invariably higher when the summer temperature was above the average, and when the rainfall

was deficient. Much depended upon the nature of the dust and the damage and injury to food exposed for sale in shops must not be lost sight of. The city engineer urged that the best course to adopt in order to abate the nuisance was to spray all macadamized roads in the city, and it was resolved to adjourn the matter until the next half-year estimates are under consideration. The report of Dr. Walford showed that in the four weeks ended July 31st there were 386 births and 150 deaths. The birth-rate was 25.8 per 1,000, and the death-rate 10.0 per 1,000. There were 42 cases of scarlet fever notified, as against 48 during the previous four weeks, and 22 cases of diphtheria, as compared with 12 cases during the preceding four weeks. The committee decided to request the Seamen's Home to take out a boarding-house licence.

MANCHESTER AND DISTRICT.

Hope Hospital.

The dispute between the Salford Board of Guardians and the medical profession represented by the Salford Division of the British Medical Association with respect to the appointment of a senior resident medical officer at the union infirmary, Hope Hospital, has now lasted about two months, and in spite of repeated advertising, the guardians have been unable to obtain a medical man to accept their terms. The grounds of the dispute were fully explained in the Journal of September 11th, p. 723. It was there stated that the guardians' first advertisement brought not a single applicant for the post, and as the senior resident medical officer left on August 31st, it was necessary to engage a locumtenent to whom 6 guineas per week had to be paid. The guardians comforted themselves with the thought that as it was the holiday season the reason for want of applicants was that young men were "mostly "doing locum work, which pays better." It was therefore decided to advertise again. The advertisement was refused by the British Medical Journal, and at the request of the Salford Division the warning notice inserted was continued. The *Lancet* also gave its support to the local profession by refusing the advertisement and issuing a warning notice. Some other medical papers, however, accepted the advertisement, and by the appointed day it was announced that four applications had been received. There was some boasting that the British Medical Association had been defeated, but this was somewhat premature. When the infirmary committee considered the applications one candidate was at once rejected as unsuitable, as he was 54 years of age. It appears that the late senior medical officer was about 30 years old, but the guardians thought that a younger man might take his place. "Too old at 30" seemed to be the idea of some of the guardians as to a medical man who was to take the responsibility for 800 pauper patients. The other three candidates were invited to appear before the General Board on September 24th when the appointment would be made. On that day, to the evident surprise of the whole board, the Clerk announced that two of the three candidates had written withdrawing their applications without giving any reasons. The third had not answered the letter of invitation. It appears that he had never sent in any application, but had only written for information, and the guardians had no right to include him as a candidate. Thus there were for the second time no applicants for the post. The position was felt to be somewhat serious, all the more since the present second medical officer had notified his intention to refuse reappointment when his year ended in October. There was, of course, nothing to be done for the moment but to appoint a small committee to make temporary arrangements. But some of the more reasonable members of the board recognized that something more would have to be done before long, and it was proposed and seconded that a committee be appointed to negotiate with representatives of the Salford Division. This met with considerable opposition, one guardian saying that "he would go black in the face before he would vote for that," and another "objected to going cap in hand to the British Medical Association," and in the end the proposal was lost. This is the position of affairs up to September 27th. No secret is made of the fact that the Salford Division would be willing to discuss the matter with the guardians; that has been understood all along. As far as the patients at the hospital are concerned, the board has been assured that they are being attended to as usual with the assistance of a locumtenent and the Salford Division has made no attempt to prevent the guardians obtaining such temporary medical help as is necessary in the interests of the patients.

Manchester University.

There has been an unusually large number of changes in the teaching staff of the university during the past year, and the winter session, which opens on October 1st, will see four new professors. Professor Elliot Smith will take the place of Professor Young, whose health has compelled him to retire from the Chair of Anatomy. The new Chair of Cryptogamic Botany, founded by a bequest of Professor Barker, will be occupied by Professor Lang, a new laboratory having been equipped and fitted up for his work. Professor Kastner will begin his duties as Professor of French Language and Literature, and Sir T. Holland as Professor of Geology and Director of the Geological Laboratories. Professor Boyd Dawkins, who is now Honorary Professor, will continue for some time to give some lectures, but the general duties of the chair will be undertaken at once by Sir T. Holland. In addition to the above, there are two new appointments in the chemical department—namely, Dr. Lapworth as Assistant Director of the Inorganic Laboratories and Dr. Weizmann as Assistant Director of the Organic Laboratories.

It is announced that the new chemical laboratories will be formally opened on Monday, October 4th, and it is expected that Lord Morley, the Chancellor of the University, will preside at the ceremony, while the laboratory will be declared open by Sir Henry Roscoe. Great disappointment has been expressed that Lord Morley will not be able to give the promised address at the general opening of the university on October 5th, owing to pressure of parliamentary duties.

Special Correspondence.

VIENNA.

Feeding with Preserved Human Milk.—The Dangers of Celluloid.

In a communication made to the Vienna Medical Society Drs. Mazerhofer and Przibram, of Professor Escherich's paediatric clinic, reported the results of feeding newborn babies with preserved human milk. The milk is drawn with a specially designed breast-valve-pump. It is possible to obtain all the milk contained in the gland by its action without the least discomfort to the woman. Then the milk is, for purposes of storage, sterilized by means of the Budde process (heating to 55° C. in the water bath, with an addition of a few grams of hydrogen peroxide). The milk thus treated is completely sterile, without any alteration in its nutritive value, taste, or appearance, as reported by Escherich and many other observers. The authors have fed forty infants with this milk; the babies throve just as well as the babies of the mothers from whose breasts the milk was obtained. The breasts seem to adapt themselves to the increased demand to which they are subjected. The advantage of this process lies in the fact that the milk can be drawn off whenever a wet-nurse is present, and can be kept until needed. As there are daily about 120 suckling women in the Vienna lying-in hospitals, and each application of the pump easily yields three ounces, a quantity of about 120 pints could be had daily for the feeding of babies of mothers who cannot suckle them. The matter was taken up by some daily papers here, and precautions have been demanded to prevent the method being made a form of commercial enterprise. The only way of preventing mischief is to restrict the use o the

method to hospitals for infants. The lives of many babies born before full term, hitherto carefully but only with difficulty reared in the *couveuse*, will in future be much more easily saved, as the keeping qualities of the milk are practically unlimited.

A number of accidents, happening quickly one after the other, in the celluloid factories, has turned the attention of the public health boards and of the industrial inspectors to the conditions prevailing in these factories. There are altogether eleven large factories and numerous dépôts of this article in Vienna itself, situated mostly in densely-populated districts. In a report presented to the Principal Board of Health by its special commissioner, the risks run by the factory hands are explained. The substance is obtained by treating cellulose by a special method; the material contains more than 5 per cent. of camphor, and when heated gives off camphorated gas. It is easily combustible, and when dealt with by machinery a very fine dust is readily produced, which being finely mixed with air, is highly dangerous, as the least spark suffices to ignite the whole mass. The result is a fearful explosion, with a very long and high flame, and enormous production of smoke and noxious gases. The only means of protecting the workers is to handle the substance under water. The principal danger for the general public lies in the fact that the flames spread rapidly to every place where the least trace of the celluloid dust is present. Thus, in the series of the last accidents, the neighbouring houses suffered from the smoke, and twelve persons were choked by the fumes. The recommendations of the Principal Board of Health are to permit the manufacture of celluloid solely in houses containing only one ground floor, no upper stories, and having at least every ten yards a door leading directly into a free space. The Municipal Board of Health, however, urges the removal of all these dangerous factories from the city into the outlying districts, where ample space can be had without endangering any other interests. The inhalation of the finely-distributed dust seems to produce chronic bronchial lesions similar to coal and iron and stone dust, but this danger can be minimized.

Correspondence.

POOR LAW REPORT AND THE SANITARY MEDICAL SERVICE.

SIR,—The letter of Dr. Lyster in your issue of last week is very interesting. In my opinion, it shows how easy it is to draw up a fascinating and convincing scheme if you only regard one side of the question. Under a system where every "poor" person might demand of the State all he required, subject of course to the "consistent code," whereby he might be made to pay, if able, I am ready to admit that the arguments put forward by your correspondent are not without weight. But to those who are opposed to such a system, and, rightly or wrongly, consider it would be injurious to the best interests both of the public and the medical profession, it is hardly necessary to deal with them till we are assured that, in spite of our utmost efforts to the contrary, that system is bound to come; then, it seems to me, will be time enough to deal seriatim with the various points that Dr. Lyster so ably puts before us.

At the present time the great evil in our profession is the amount of gratuitous work given to the public. The proposal of Dr. Lyster, and the supporters of the Minority Commissioners, is to increase this gratuitous work, but to pay the present general practitioners by making most of them State officials. To those practitioners who have little or nothing to lose under the present system no doubt the proposal is not unattractive; but to the rest, who, I hope, are a much larger class, I fail to see the attraction. It must always be preferable to a man of average ability to live an independent life, relying on the public for support, rather than be a poorly paid official, provided that his practice is not subject to unfair competition on the part of the State. If in every poor district there were State doctors from whom all "poor" persons could obtain gratuitous medical attendance, the "depletion of the ranks of the general practitioners" would not in my opinion tend to the "increased prosperity of those that were left." Where the independent practitioner knew that his patients, if they chose, could go to the State doctor, and be attended for nothing, he would have to be satisfied with very moderate fees. The "sixpenny doctor" might have to become a "threepenny doctor" to secure an independent living. But I think that here Dr. Lyster's views run contrary to those of the Minority Commissioners, who rightly consider that their system would be death to the cheap doctor, and speak openly of getting rid of the "cheap substitute." So that, as only cheap doctors could expect to thrive in poor districts, the State doctors would get the whole field to themselves. I demur, likewise, to the statement "that it is *obvious* that the total remuneration from the public to the medical profession would be enormously increased," etc. It might, or it might not be.

The scheme that Dr. Lyster so well enunciates has been not inaptly termed the "apotheosis" of the Sanitary Medical Service. The Poor Law medical officer might well ask where he comes in. Dr. Lyster shows the position the Sanitary Medical Service takes in Mrs. Webb's proposed county medical service; but the latter admits "that at present, with his D.P.H. diploma, the M.O.H. is apt to get all the plums." According to Dr. Lyster's views, he would continue to keep all the plums, and I do not see how his proposals would bring about the reforms "long demanded by district medical officers."—I am, etc.,

MAJOR GREENWOOD,
Honorary Secretary, Poor Law Medical Officers' Association of England and Wales.

London, N.E., Sept. 25th.

SIR,—Dr. Robert A. Lyster has written a long letter in support of the Minority Report of the Poor Law Commission, and seems to think that all general practitioners, all Poor Law doctors, and all medical officers of health should encourage and support it. Why?

It seems that every one of them is to have his "job" taken from him more or less in its entirety and given to somebody else—some hypothetical new official.

This, I believe, will be most probable: A "county" man at £400 to £800 per annum with a subordinate staff of medically qualified persons at £250 per annum, or less—all whole timers, because they are not so independent and, therefore, can be "handled" better. Under these a medley of inspectors, health visitors, nurses, school teachers (pressed into the "service"—gratis, of course), midwives, dispensers, perhaps followed by unqualified "oculists" and "aurists," *et hoc genus omne*.

Heaven help us as a profession if we let things slide in this direction, as we have done in the past!

Dr. Lyster says that medical officers of health to small districts are paid a miserably inadequate salary, are not heads of their departments, are subject to impertinent interference from clerks, have no control over sanitary inspectors, and work under disheartening and degrading conditions. That they are underpaid is true; but they are much better paid than club doctors. If they are not heads of their departments—well most of them are, I think, and of those who are not, it may be that some owe it to their own behaviour. That there may be places where things are wrong I admit, but if there were not, it would be a phenomenal service; these remarks apply also to the "control" of inspectors.

As to being subject to impertinence from clerks. Well, who is not? Fortunately some clerks are gentlemen, and although friction will occur, I do not quite see that "impertinent clerks" should be a reason why officers in another branch of the service should lose their posts.

That the work is disheartening is true, *sometimes*, but not nearly so much so as club practice and practice among the poor, where the necessities of life are very meagre or even absent altogether. That it is degrading I deny. Honest and conscientious sanitary work under the worst conditions cannot degrade—rather the reverse. Of course, a "small" district has a small pocket, and it cannot do as wealthy boroughs do, any more than the poor clerk can emulate the wealthy merchant, but is he on that account more degraded?

The real crux of the whole matter is Payment. The public bodies pay the market price. However small an appointment is, it is invariably canvassed for most energetically when vacant, and why should more be paid? If I were a member of a public body and could get properly qualified and experienced men at a certain figure, and knew

that five or six equally eligible men were ready to take it, I would not pay more.

It is not the public bodies who are our enemies; it is ourselves—our noble selves.

If we can unite for each and every branch of the profession to get proper remuneration, be he general practitioner, club doctor, or public officer, then there will not be such an incentive to undersell one another or get hold of another man's "job," and we could then look with equanimity upon any suggested alteration of Poor Law or Sanitary Law.

Last of all, is it not the acme of credulity to imagine that if the present holders of these posts are displaced the newly appointed men will be better off?

If money cannot be found to pay adequate remuneration for the work now, how is it likely that it will be found to pay men to do five or six times the amount of work at even the present rate of pay?

Let us get a proper scale of pay for work now, and after that, let them pile on as much work as possible, for all we want is work—properly paid for.—I am, etc.,

Northwich, Sept. 27th. HENRY EDWARD GOUGH.

SIR,—Your leading article of August 21st, and the subsequent correspondence arising out of my address on the Poor Law Commission report, impel me to offer a few remarks in reply.

It is a matter of great regret to many of my colleagues in the public health service, and also to many outside it—all members of the Association—that while the article disclaims any desire to appear hostile to the large body of medical officers of health, the value of that disclaimer is at once discounted by the suggestion that not only is it undesirable to entrust the members of the sanitary service with additional duties, but that they should be deprived of some of their present functions.

It is true that Dr. Downes in his extremely valuable memorandum suggests that fever hospitals might fitly come under the control of a revised Poor Law authority, but it is a matter of surprise that a scientific journal should not be alive to the manifest disadvantages which must arise from the combination of midwifery practice and daily attendance at a fever hospital. Personally, when in private practice, I well know that in many cases my practice suffered, especially among children, from a very natural hesitation to employ a doctor who saw twenty or thirty cases of scarlet fever every day. Public officials are apt to forget these things, but the general practitioner is fully alive to them.

The position of the part-time rural medical officer of health demands serious consideration, and, while I quite agree with the views of Dr. Lyster, I would remind you that his extinction has been approved by the Representative Meeting of the Association, although this course may not commend itself to the existing holders of the office.

The danger which we have to face here is the break-up of combined districts under the auspices of the Local Government Board and the creation of a number of small whole-time appointments which will be insufficiently paid for. At the same time, it is hard to resist the impression that whatever scheme for the reform of the medical relief of the poor the country may adopt the time is at hand when most men in general practice will have to choose between an official appointment with a small but secure income and the hazardous chances of competition with the State, either on the dispensary system or as suggested in the report of the Minority.

I am sorry that there should be some misapprehension as to my reading of Dr. McVail's report; it is a document which should be read from cover to cover by all who aspire to master the subject. The passage upon which my remark was founded reads as follows:

> It ought to be the duty of every medical officer of every such institution not merely to attend patients during illness but to offer a periodical, perhaps an annual, medical examination of every individual on his list, child and adult.

At the present time every child of the class indicated is medically examined four times between the ages of 4 and 14, is then further examined by the factory surgeon before going to work, and is subject to inspection by other officers such as I have mentioned. If, as Dr. McVail suggests, the medical officer possessed a complete life-history of every patient on his list, the functions of the school examiner, the factory surgeon, etc., would become superfluous or the amount of overlapping would be extensive and costly.

Other opportunities will arise for discussing our respective views, and I desire to thank Dr. McVail for his courteous criticism and correction.

In conclusion, Sir, like my friend Dr. Lyster, I humbly deprecate *ex parte* utterances in the official organ of the Association. There is already a committee appointed by the Council to consider the report, there is every prospect of a joint committee of the Poor Law Medical Officers' Association and the Society of Medical Officers of Health, and there is no immediate hurry for a decision. When a decision of policy is arrived at in the Association after full discussion, I trust that if I and those who agree with me are a minority we shall accept any real effort on behalf of the profession as a whole.—I am, etc.,

West Bromwich, Sept. 25th. HERBERT MANLEY.

SIR,—I feel sure that all medical officers of health must join issue with Dr. Lyster in the feeling of relief experienced by your assurance in the JOURNAL of August 28th that you have not yet made up your mind as to the effects of either report of the Poor Law Commissioners. Your previous article of August 21st certainly left me under the impression that you were strongly in favour of the Majority as against the Minority Report.

It appears to me to be most essential that in a crisis of this kind district medical officers, medical officers of health and general practitioners should all rally together to obtain that which is most beneficial to the profession generally as well as to those for whom the improvement is required—namely, the poor.

So far as the general practitioner is concerned the poor are a burden to him, as I think the experience of all practitioners is that work among them always ends in giving gratuitous advice, and he will be only too pleased to see the poor properly provided for. As regards the district medical officer, his position since the establishment of medical inspection in elementary schools has been rather an ambiguous one, and is fated under existing circumstances to become more so.

As regards the medical officer of health, the poor are his special charge. In urban districts he protects them from overcrowding, and in rural districts he obtains for them a pure water supply. In both districts he inspects their children in the elementary school in the neighbourhood. If he finds in the latter capacity that children who have adenoids to a severe degree have parents who are too poor to employ a local surgeon or even to pay their train fare to the nearest hospital, he has no jurisdiction over the methods of obtaining relief, and the consequence generally is that nothing whatever is done.

The Education (Administrative Provisions) Act of 1907 has placed in our hands a means of improving the physique of the race, but it is impossible to do so without some means of co-ordinating the various influences which affect the poor.

What is required is one medical officer at the head of a department, who can give advice to the various committees which have some dealings with the poor, whether it is a complaint of overcrowding, a badly-nourished child discovered in school by one of his assistants, a case of typhoid fever in a cottage with a polluted water supply, or a case of phthisis in a bread-winner.

He will be the means of communication between the various committees, each of which will have its own medical officer, who will act under the instruction of the chief medical officer.

In the Minority Report, as I read it, both the county medical officer and the registrar would act in this way as intermediaries between the various committees.

I am strongly in agreement with Dr. Lyster in his opinion that the Minority Report if adopted would remedy in a great measure a number of the present unsatisfactory conditions of the profession, as general practitioners would be freed from gratuitous patients, whilst district medical officers and medical officers of health would be placed in a more secure position.—I am, etc.,

J. ALBERT GIBSON.

September 27th. Medical Officer of Health, Newport, I.W.

SIR,—Although there is but slight probability that the suggestions in either the Majority or the Minority Report will become law at an early date, your leading article suggests a wide field for discussion.

Dr. Lyster's experience can hardly be derived from the Home Counties, or he would not have made such sweeping assertions as to the position of medical officers of health in rural and small urban areas. I can assure him that many of us (at all events, those devoting our whole time to the work) *are* heads of our departments, are treated with the greatest respect and courtesy by both our local authorities and their clerks, and have as much control over our sanitary inspectors as we can legitimately expect or require. If a medical officer of health has acquired practical as well as book knowledge, and possesses the knack of dealing with men, he need have little fear on these scores—at all events, in some parts of England. Sanitary inspectors, like all other officials, vary; my experience of them is that most are reasonably reliable and efficient—at least, the younger generation of them.

We have, of course, among our grievances, that of insecure tenure—a matter which might have been dealt with once and for all by the present Government, had they so chosen, in the Housing and Town Planning Bill, and it was not for want of support from their own side of the House that they failed to do so To remedy this it is suggested that we shall either receive "full compensation" or become "local assistants" to the county medical officer. The former alternative is not attractive to whole-timers, since the compensation is never adequate under such circumstances, while—speaking for myself and many of my colleagues—we have not the slightest desire to be assistants to any medical officer of health—county or otherwise.

At present we are responsible executive officers who can control our own comings and goings, and we should be sorry to account for our actions to an official who might be junior in age and experience, and who might perhaps have never held an important executive appointment. Presumably, we should not even be assured of the humble salaries that we now draw. It is not difficult to conceive that a county council, after providing for a chief and one or two principal assistants, would consider £250 a year adequate for the hosts of assistants that would be required for the sanitary, education, and other functions of the department.

Dr. Lyster criticizes Dr. Downes's scheme as taking away from the medical officer of health many of his present interests. With the possible exception of the education work, surely this suggestion is fanciful? Even as regards the inspection of school children, at the present time it is by no means every education authority that has availed itself of the services of the medical officer of health, and, until the recent Act was passed, the number of medical officers of health who undertook such work could almost have been counted on one's fingers. Did the remainder find time hang heavy?

The Minority Report must strike some who have had experience of administration on a large scale as the scheme of a visionary whose idea is centralization, but who has no knowledge of what practical and efficient supervision of such an enormous number of subjects, many of them demanding prompt action, by one individual would involve in county areas, at all events outside that of London. It is difficult to believe that it would lead to efficiency; it would be much more likely to lead to interminable delays and red-tapeism.

Even in some large towns with which I am acquainted it has proved desirable to decentralize the water, sewage, and general engineering departments, formerly under one management, but now under separate responsible heads, to the great benefit of the community. If this be so in a town with its compactness, with its common interests, and with this comparatively small field of energy, how much more is it likely to be true in a county of considerable area composed of all types of communities, and ranging over so vast a field of activity as is suggested by the authors of the Minority Report!

The field is so extensive and the number of meetings of the councils and their committees would be so great that the present constitution of these authorities would have to be entirely changed. It may be possible for a man of affairs to attend his numerous committees in a town with reasonable regularity, but it is entirely different in a county, where a member may not be able to reach his home the same day if he stays till late in the afternoon. Hence it is doubtful if men who had other occupations could find time to serve on county councils.

The alternative would be for the administration to become a mere bureaucracy—perhaps an advantage in some respects, but entirely contrary to popular notions of local government.—I am, etc.,

September 27th. M.O.H. TO A COMBINED DISTRICT.

COURT-MARTIAL ON A FLEET SURGEON.

SIR,—The thanks not only of the Naval Medical Service, but of the entire medical profession, are due to you for your outspoken editorial on the scandalous prosecution of Dr. Charles Geekie Matthew. I hope also that the matter will form the subject of a question in the House of Commons.

As an old naval surgeon I know to my cost how very true your words are. As a rule, to which there are few exceptions, every self-respecting naval surgeon leaves the service as soon as he can possibly afford to do so. When I resigned my commission I was holding a special appointment with a house and extra pay; but even this, and the fact that the Director-General himself pressed me to stop on, and I think I can truthfully say, it was hinted that I was about to receive special promotion—even in spite of all this I resolved to be one of the many who prefer the self-respect of mufti to the glittering gold stripes, which in a naval surgeon's case mean nothing.

When the navy makes up its mind to treat doctors properly, it need not fear for the qualities of those members of the medical profession who enter its service.—I am, etc,

Sevenoaks, Sept. 25th. GERALD SICHEL, F.R.C.S.

SIR,—With all respect, I think that the tone of your article (p. 901) on this unhappy incident is greatly to be deplored, and that you are not promoting the welfare of the Naval Medical Service by trying to deter the best men from entering it. You must know that this case is most exceptional. The normal relationship between the medical and executive officers is excellent. They are generally the best of friends, as was evidenced even in this court-martial, where the witnesses in the defendant's favour were the captain and a lieutenant. The current number of the BRITISH MEDICAL JOURNAL affords a striking instance of the friendship generally existing between the medical and executive officers, where, on p. 881, a lieutenant and a surgeon combine to write a paper on a subject each is equally interested in. The Naval Medical Service has been brought to a high state of professional efficiency under our present able Director-General, and we do not want to throw it open to the wasters of the medical schools. It is a splendid service, and no one need regret joining it either from a professional or a social point of view. With the best of companions (and who so popular as the average naval officer?) one sees the world; the opportunities for visiting foreign hospitals and studying rare diseases are to be envied; whilst the naval hospitals are up to date, and the work done in them is of a high order, as may be seen from a study of the operation tables in the Statistical Report of the Health of the Navy which has just been published. It would therefore be most deplorable if this wretched case should prejudice the entries into the senior service, whose glorious traditions are shared alike by all naval officers, in whatever branch they are serving.—

September 25th. ANOTHER FLEET SURGEON.

⁂ We may point out that no charge was made against the bulk of the executive officers of the navy, who are generally level-headed and sensible. The article was directed against a certain class which it is evident does exist, or this "unhappy incident," as it is termed, would not have occurred. No one can read the evidence as reported without indignation, and not to resent such an occurrence would indicate a lack of self-respect which is happily not wanting in the majority of medical officers. Rhetorical commonplaces about the "glorious traditions of the senior service" will not ameliorate the unfortunate conditions under which medical officers sometimes have to serve, and professional ability in hospitals will not make up for arbitrary

treatment on board ship. It is necessary to point out the grave disadvantages as well as the advantages of the Naval Medical Service. That the latter exist is unquestionable.

THE CRESCENDO MURMUR OF MITRAL STENOSIS.

SIR,—After a lapse of some years Dr. Brockbank has again come forward[1] to try and convince the profession that the so-called presystolic murmur is in reality caused by the commencing systole of the ventricle, and not by the auricular contraction at the end of ventricular diastole. This view, as he reminds us, was strongly advocated by the late Drs. Barclay and Charlewood Turner and by Dr. Dickinson, and he claims to have brought forward additional arguments in its favour, and to have shown that the more generally accepted view is not tenable.

It appears to me, however, that Dr. Brockbank is taking a somewhat different standpoint from that occupied by the champions of twenty or thirty years ago. The discussion then was as to the physical explanation of the whole of the long rumbling or churning sound which occupies the apparent diastolic interval in many cases of mitral stenosis, varying in duration, but often one-third of the heart's cycle, and ending in a loud first sound. On the other hand, Dr. Brockbank puts very severe limits to the murmur in question, his so-called "crescendo murmur." He says:

"It is that murmur which has for its essential characteristics a pitch which rises progressively and a force which increases progressively and a sudden termination, with an abrupt first sound when at its highest pitch and maximum vigour. It only occupies the terminal part of the interval between the second and first heart sounds, and is probably not more than 0.1 second in duration, and generally less than this."

I observe that this murmur has grown shorter, for in his former paper (1897) Dr. Brockbank stated that "it only occupies one-sixth of a second of time, or less."

I gather that he allows that mitral stenosis may cause a diastolic murmur beginning immediately after the second sound, and continued through the diastole; and that such murmur may directly or indirectly end in a loud first sound. But what he insists upon is that the last small portion of this long murmur, equal to 0.1 of a second or less, occurs during the beginning of ventricular systole and not during the end of ventricular diastole. If the reader will look at his diagram[2] (Fig. 2, under line E), it must appear to him that Dr. Brockbank's position is that somewhere about five-eighths of the heart's cycle, beginning at the second sound, the murmur of diastole is replaced by, or runs into, the crescendo murmur, which, he says, is produced by systole; and that this last portion is the only one which increases in pitch and loudness.

But if he admits that the long rumbling or churning murmur is in four-fifths or five-sixths of its length diastolic and due to a direct current, he concedes a great part of what Dr. Barclay and others denied, and his own contention is confined to the method of causation of a short murmur of rising pitch and loudness, in duration not more than one-tenth of a second, whether it stands alone (Fig. 2, B C D) or is in continuation of a longer admittedly diastolic and obstructive murmur.

Thus put, it seems to me that the matter is of much less importance than as it was formerly presented. On the other hand, it is much more difficult for either disputant to prove his point.

One of the difficulties I find about this view is the following: I do not see by what auscultatory criteria the change from a direct-flow murmur to a regurgitant murmur can be recognized unless it be by a rise of loudness and pitch in the last one-tenth of a second preceding the first sound.

In the first place, as to loudness, it must surely be the experience of all of us that the long, rumbling diastolic (or presystolic) murmur often increases in loudness long before the last tenth of a second—sometimes almost from the beginning. This is supported by the tracing from Weiss and Joachim which forms Fig. 5 in Dr. Brockbank's paper.[3]

[1] BRITISH MEDICAL JOURNAL, August 28th, 1909, p. 509.
[2] Loc. cit., p. 511.
[3] Loc. cit., p. 513.

Then, as to the pitch of the sound upon which Dr. Brockbank lays much stress. It is, indeed, the chief argument by which he carries the discussion beyond the stage at which it was left twenty years ago; and it is that upon which he based his article in 1897. But the pitch of the murmur was never considered at all in the older controversy.

He looks upon a rising pitch as indicating a narrowing orifice, which rising loudness does not. I have tried the experiment with the indiarubber tube, but I am not impressed by it. There is too much personal equation, and the effort of closing the teeth upon the tube must, of course, interfere with the volume of air in the mouth being delivered to the tube, and must alter the size and shape of the resonating cavity. The observation must be influenced by the proximity of the jaw-joint and masseter muscles to the ear. If in trying to imitate exactly the cardiac conditions the teeth are closed upon the tube at the relatively slow rate of sixty times in the minute, it is to me very difficult to appreciate an increase of pitch and loudness in the terminal tenth of each of those seconds. Possibly a more satisfactory method of demonstrating this point could be devised. For myself, I have often listened to typical presystolic murmurs, and have failed to appreciate any rise of pitch at all.

Weiss and Joachim, in the article to which Dr. Brockbank refers, say nothing about pitch in this connexion. They give a few figures showing the duration of the waves of which the normal first and second sounds appear to be made up; and they vary from 66.7 to 166.7 per second. In any given sound there was little uniformity in the wave-lengths. Beyond this I think no positive conclusions of any value could be drawn.

But granting that in some murmurs increasing loudness and pitch are the characteristics of the latter portion, I fail to see that Dr. Brockbank has yet shown that such a condition cannot be produced by the direct flow or by auricular contraction, and must be due to ventricular contraction alone. The pitch of cardiac and pulmonary sounds is a subject which still requires a great deal of investigation.

Dr. Dickinson urged that the presystolic murmur must be systolic, because in cases in which it was followed by a systolic murmur, he could only perceive these two murmurs as continuous and identical in sound and characters; and he regards it as inconceivable that the engines could be reversed, so to say, without some more striking indications. Other people said, first, that such indications, or at least accompanying phenomena, were the first sound of the impulse; and secondly, that the two murmurs were by no means identical or even similar. But Dr. Brockbank is assuming a reversal of engines in the course of a long rolling murmur with either no indication at all, or for less than Dr. Dickinson would have allowed.

Sir John Broadbent[4] has dealt with the argument which Dr. Brockbank bases upon cardiograms. I should like to add that it is obvious that Dr. Galabin's tracings, xi and xiii, recorded the movements in connexion with a murmur much longer in duration than one-tenth of a second; indeed, demonstrably, two-fifths, in Fig. xiii.

Dr. Brockbank's appeal to the recent work of Weiss and Joachim is not, to my mind, much more successful. They point out, he says, that in Fig. 4 (their Fig. 20) the first vibrations of the murmur are only 0 13 or 0 14 sec. removed from the carotid elevation; but in Fig. 5 (their Fig. 22) the vibrations begin within 0 05 sec. of the second sound and 0.41 sec. from the carotid elevation. There is a roughly uniform increase in the amplitude of the vibrations from this point: the three large waves obviously represent the "very loud first sound," and there is no indication before this point of the interposition of the ventricle in what is clearly, from its length and relations, a diastolic murmur. Either it is a diastolic murmur running on to the first sound, or if it is a crescendo murmur of ventricular origin, it occupies 0.3 of a second, instead of 0.1, and it leaves only 0 05 second for ventricular diastole—one-twelfth of the heart's cycle.

A consideration which weighs with me in inclining still to the ventricular systolic theory is the following: The presystolic or crescendo murmur of mitral stenosis occurs in a relatively early stage of the disease. In many cases the later stages are entirely free from it, and the murmur

[4] BRITISH MEDICAL JOURNAL, September 18th, 1909, p. 821.

or combination of murmurs which succeeds it is a short systolic murmur, followed by a diastolic (mid-diastolic) murmur varying in length, coming a little after the second sound, and ending before the next first sound. Dr. Brockbank ascribes the crescendo murmur to the rigid valves preventing the rapid closure of the orifice when the ventricle first contracts. But the valves are just as rigid and slow of movement months later when no crescendo murmur occurs, and when, nevertheless, the ventricular systole lifts the aortic valves and the impulse occurs without any preliminary loud crescendo regurgitant murmur.

A regurgitant murmur there is, but it is with and after the impulse, with and after the first sound, so far as this is present. If the valves were too rigid to close promptly in the early stage, they are not less rigid now, and yet there is no crescendo murmur preceding the first sound and impulse. This, too, is in a stage, as a rule, of less compensation, and less venticular efficiency.

Further, in many cases of mitral stenosis there occurs a period in which a mid-diastolic murmur is heard without any crescendo portion while compensation is lacking; and the presytolic murmur returns when cardiac efficiency is temporarily improved or restored; and there may be frequent changes from one to the other condition, even in the course of a few hours or a few days. There can be no alteration of the valves to account for it. On Dr. Brockbank's theory, the stronger the ventricle is, the less able is it to lift the aortic valves without a preliminary regurgitant mitral flow, and vice versa. The view that the ventricle cannot contract upon its contents sufficiently to open the aortic orifice until it has closed the mitral valves seems to me to want a solid foundation. Cases of mitral regurgitation exist by thousands in which the valves are never effectively closed, and yet the blood is distributed through the system by ventricular action. It is rather a subtle distinction to draw between a regurgitation in stenosis, which practically abrogates the function of the ventricle for the time being, and the ordinary mitral regurgitation which does nothing of the kind.

And these ventricular contractions which cannot drive blood through the mitral orifice and the aortic valves at the same time, and are too feeble to give an impulse, yet produce one of the loudest murmurs in cardiac pathology.

There are cases, too, of mitral stenosis in which the only murmur present is purely systolic in time, and begins with the impulse of the heart—that is, in spite of the rigid mitral valves, and the demonstrable ventriculo-auricular leakage, there is no delay of ventricular impulse.

Does the fact that the crescendo murmur is only heard in the back with extreme rarity present no difficulties?

The position I should take at present is that in mitral stenosis murmurs occupying the greater part of diastole are admittedly auricular in origin either by direct flow or by muscular contraction. That these are sometimes accompanied by thrill and sometimes increase in loudness. That there is nothing to show that the last small portion cannot be produced by auricular contraction, or that they must be produced by ventricular contraction. That what is true of the last fifth of a lengthened murmur is probably true of a similar murmur when occupying diastole in its last fifth alone.—I am, etc.,

London, W., Sept. 28th. FREDERICK TAYLOR.

LINACRE AND THE "GRAMMARIAN'S FUNERAL."

SIR,—In the JOURNAL of September 11th Mr. Munro Smith refers to Professor Osler's identification of Linacre with the scholar pictured by Browning in his "Grammarian's Funeral." I suggested in one of my notes to the reproduction of one of Linacre's translations, published at Cambridge in 1881, that Browning's poem might be based upon a passage in Erasmus's "Praise of Folly," referring to (though not naming) Linacre as a very accomplished scholar, who showed an excessive devotion to the study of grammar. In my Harveian Oration for 1892 I referred to the subject again, quoting the passage from Erasmus and two passages from Browning's poem for comparison.

I hesitate to reproduce the quotation from Erasmus, but if you think it worth the space, it may be thus translated (*Folly* is supposed to be speaking):

> I know a certain man, skilled in many arts; a Grecian, Latinist, mathematician, philosopher, physician, and in all these a supreme master, now 60 years old, who, neglecting everything else for twenty years past, tortures himself in the study of grammar, thinking that he will be fortunate should he live long enough to distinguish with certainty the eight parts of speech.

Erasmus's satire was evidently meant for a piece of good-natured chaff at the expense of his friend Linacre, as it was written in his lifetime. The work hinted at was Linacre's treatise on Latin composition, dealing largely with "parts of speech," which occupied him till the very end of his life. Erasmus could not know that Linacre would be correcting the last proofs of this book almost on his deathbed; but so it was, for the book came out soon after his death. Possibly Browning did know this, and hence wrote:

> So with the throttling hands of Death at strife
> Ground he at grammar;
> Still through the rattle, *parts of speech* were rife.

Another point of resemblance is that the grammarian is represented as suffering from calculus, the disease of which Linacre died, but this may have been a coincidence.

On the whole there seems enough to show that Browning had Linacre in his mind, at least so far as he was portrayed by Erasmus, and I quite agree with Professor Osler's later identification.

But, as Mr. Munro Smith justly remarks, it was probably a composite picture, since there are features in it which do not belong to Linacre. It is possible that Browning may have known something of Isaac Casaubon, but he does not seem to me likely to have been his model. Casaubon, though a scholar, could not be called a grammarian, and lived in the seventeenth century, not at the time of the revival of learning. The early life of Browning's hero is quite unlike that of Linacre or Casaubon, or any one else who has been mentioned—a young man who up to middle life is nameless, then leaves play for work, and "gowns him." This fits very well a member of our profession, Julius Caesar Scaliger, a great scholar and grammarian, born 1484, and so a younger contemporary of Erasmus and Linacre. Till middle life he was one of the Emperor's pages and a soldier, when, suddenly giving up the life of camps and courts, he devoted himself to learning and medicine, so that the rest of his life was much like that of Linacre, and he had an immense reputation as a scholar in his day. I know nothing of his last days. Indeed, the career of Scaliger might almost be enough by itself to explain Browning's poem, only I feel sure the poet must have known the passage in Erasmus, as he was a great reader of neo-Latin literature.—I am, etc.,

New Barnet, Herts, Sept. 18th. J. F. PAYNE.

MEDICAL SCHOOL INAUGURAL ADDRESSES.

SIR,—In view of the present unsatisfactory financial state of the profession, which continued overcrowding will only increase, would it not be just both to the profession and intending members if the medical school inaugural addresses contained a few home truths as to prospects instead of the usual platitudes they mostly do to the effect that "Medicine is its own reward" (which it is, but not in the sense meant)? It would be well to point out in no uncertain voice that in no other profession or calling are the results so meagre in "profit and pleasure" for the majority as usually understood, especially under present conditions.—I am, etc.,

Ayr, Australia, Aug. 13th. J. BOOTH-CLARKSON.

THE DOCTOR AS A PHILANTHROPIST.

SIR,—Referring to the letter of Dr. Arthur Todd-White, in which he expresses disapprobation of the small fees charged by certain medical men, is it not the fact that these fees are the logical outcome of the cut-throat and ruinous (to us) competition of hospitals, public dispensaries, and the host of other medical charities?

I contend that medical men in poor neighbourhoods, especially when they are surrounded by charities, are forced in self-defence to unwillingly lower their fees. I live not far from that palatial, exuberant, but indiscriminating charity, the London Hospital. There all and sundry can have advice, medicine, etc., possibly as good as they would get from the general practitioner, for 3d. This charge is, of course, regarded by the patients as full

market value for the attention received. Hence, why should they go to a general practitioner and pay more?

There is only one reason that I can see, and that is the delay in the ever-crowded waiting-rooms before the patients' more or less urgent needs are attended to. Rather than wait, a few find it worth while to pay a "private" doctor a little more. I think the action of the doctor in South London in charging the fees quoted by Dr. Todd-White is to be commended, assuming that he had unscrupulous competition from medical charities to meet. It is better that the fees, small as they are, should go into the pocket of a doctor rather than swell the receipts of one of his competing charities. After all, 3d. or 4d. per head per consultation is better paid than club practice, and it has the further advantage that one need not turn oneself into a doormat, as many "clubbers" expect their doctor to do.—I am, etc.,

London, E., Sept. 27th. East-Ender.

CLINICAL TEACHING.

Sir,—The reference in "Progressive's" letter (September 18th) to the clinical study of the out-patient is very important. Like most of the men of my time, I attended a clinical lecture once a week more interesting than the systematic lecture, inasmuch as it referred to one case or a group of cases considered only as to diagnosis and treatment. We went round the wards with the physician almost daily, and studied some cases more closely as clinical clerk in charge of two or three beds. But all these were serious cases; many appeared subsequently in the *post-mortem* theatre. The training was most important and valuable, but it was too ponderous. The earliest patients one sees in practice are not bed-ridden at all, nor deadly, nor even obscure. Yet the very thoroughness impressed upon us as all-essential tended to confuse when we met with a trifling illness—trifling medically, not so to the sufferer. A complete and careful diagnosis is not appreciated by the common or everyday patient, who likes a doctor to tell him the matter before he has told him his complaint. I was locumtenent to a provincial doctor who was said sometimes to settle what was the patient's illness while on the way to the house, and at least on one occasion made his diagnosis to fit in to his preconceived opinion—quite erroneously. Something between these extremes should be taught. Show to the student how with a brief inspection he can distinguish between a patient complaining of illness in whose case elaborate or detailed examination of the different systems, family history, is required, and so forth, and the case of a patient who may be summarily dismissed with a simple prescription such as mag. sulph. or inf. quass. As a question of bread and butter this is really of importance, and is perhaps the chief virtue of the old apprenticeship. The methods of Harley Street are all right in their place; but we do not all live there, or near there in club practice. If I mistake not, the out-patient clinic, where it exists, is limited to a percentage of the numbers that actually attend—that is, it is an extension of ward teaching.

Is it not worth while to consider those crowds of trivial ailments? Is a bottle of medicine everything? A former junior resident told me that he usually saw from 100 to 120 out-patients every day, and that after a week or two's experience he got this work over in about three hours. One who a year or two ago had been assistant to a doctor who had many clubs, told me that he frequently saw 130 patients a day, including, of course, his visiting list. Both of these are capable men, and I think I may believe their statements. Is this sort of thing necessary in the interest of the young medical man? Nay, is it not injurious, as tending to induce a superficial and careless habit of treatment? The strain to a too conscientious mind must be ultimately injurious. Then what opportunity has the resident—in London at all events—for study for higher professional honours?

As to examinations. In the final the clinical should be counted separately from the written part. That is, a man who passes well in the written, and is not quite successful in the other, should *not* have the worry of another written examination, but should come up again after two or three months' study of concrete illness only. The examinee should not be needlessly harassed. I have been told that a certain body of examiners hold their clinical examinations in the evening between 6 and 10 o'clock, and that the candidates are delayed in town many days awaiting their alphabetical order. This, if true, would be rather brutal; for the student and examiner alike are more or less fagged at the close of the day. The former has already a weight of anxiety hindering him that the other has not, therefore give him an open field and a fair chance of showing his best in the race.—Yours faithfully,

September 28th. Not a Consultant.

CANCER OF THE BREAST.

Sir,—The following might be of interest to "Inquirer" on the above subject: Dr. A. J. Chalmers of Ceylon, who has studied the incidence of cancer in that country, finds that cancer of the breast occurs in only 8 per cent. of the cases in females; and in answer to a similar inquiry wrote me that in his opinion the comparative freedom from cancer of the breast among the natives was due to two causes: (1) The proper functional use of that organ; and (2) the entire absence of the irritation and pressure of corsets so common among European women.—I am, etc.,

Forest Gate, E., Sept. 28th. F. B. Skerrett.

PROFESSIONAL ADVERTISING.

Sir,—The subject of professional advertising is not a pleasant one, and there must be many practitioners who could say a good deal about it if they chose, but they not unnaturally shrink from doing so. It is quite impossible to acquit most of those practitioners of the consultant class, whose names are classified in various little publications as being pre-eminent in this or that speciality, of ignorance of the fact that their names appear, and of direct or indirect responsibility in the matter.

In common with many others, I have received "change of address" cards from consultants who were absolute strangers to me, so that these must have been scattered pretty broadcast.

In one instance a lady whom I had never met sent me a highly technical reprint describing a radical operation devised and carried out by a surgeon of some repute. This was accompanied by a letter asking me to recommend him, and as apparently she had a whole batch of these reprints to dispose of, it is hardly likely they could have been obtained without his knowledge. A patient of mine who lets rooms not long ago had a medical man as a tenant who told her at the outset that his name occupied quite an important position in *Who's Who*, and that few people had more letters after their names. I have verified this. The only letters with any significance are those of the triple qualification of Edinburgh and Glasgow, and these by themselves scarcely seem to justify the inclusion of his name in the publication referred to.

Among some firms of general practitioners, the systematic visiting of all newcomers to the district by the wives is reduced to a fine art, and so barefaced are the methods adopted that there seems hardly any length to which they dare not go. Among other firms it is the religious drum that is constantly beaten for advertising purposes. While one partner is a militant political dissenter, another is a staunch Churchman, while the assistant is, as in a case I know of, a Roman Catholic. Those patients not swept into the net of this triumvirate would be classed as professed agnostics.

All these are matters which, however objectionable they may be, are best left alone. Professional advertising has always existed, and I imagine will do so to the end of time.—I am, etc.,

September 27th. F.R.C.S.

THE TREATMENT OF CHRONIC DYSENTERY.

Sir,—I must enter a protest against the method of passing the sigmoidoscope which Mr. Cantlie describes in his paper on the above subject in your issue of September 18th. Anyone reading his description would, I think, infer that the instrument is passed by feel with the obturator in position, the sensations of the patient, painful or otherwise, being used as a check on the amount of force used in introducing it. This is an absolutely wrong and dangerous method of passing the instrument, and if followed may easily lead to serious consequences. As soon as ever the

end of the tube has passed the anal sphincters the obturator should be withdrawn, and the instrument passed by sight alone. The instrument should not be pressed into the bowel at all, but guided in, a way being made for it by a puff of air from the bellows when necessary.

Mr. Cantlie goes on to say that if the patient complains of pain when the end of the instrument reaches the recto sigmoidal junction the bowel is abnormal. I entirely disagree with him. Pain under such circumstances is due to improper use of the instrument, and can be equally easily caused in persons with a perfectly normal bowel. The mucosa of the higher part of the rectum and of the sigmoid flexure is quite insensitive, and pain experienced by the patient during the passage of the instrument is not due to contact with ulcers or other lesions, but to the meso-sigmoid being stretched, generally as a result of attempts to pass the tube round an acute angle in a patient with a short meso-sigmoid. If the instrument is properly passed, the patient should not experience any pain even when ulcers or other lesion exist in the bowel.

Personally, although I have examined a large number of cases of chronic colitis, both ulcerative and dysenteric, I have never once seen any stenosis of the bowel complicating the condition. In fact, specimens of stenosis of the bowel following dysentery are so rare that, although I have taken some trouble to look for them, I have never yet succeeded in finding one. Mr. Cantlie also states in his paper that a cure of chronic colitis after the operation of appendicostomy is always a slow and tedious process. Our experience at St. Mark's Hospital, where we have treated a considerable number of such cases by this operation, has been the exact opposite. Cure is generally very rapid, all symptoms disappearing in from about three to four weeks. And surely this operation is in every way much to be preferred to a left inguinal colotomy.—I am, etc.,

London, W., Sept. 27th. P. Lockhart Mummery, F.R.C.S.

WILLIAM BLAKE'S DRAWINGS.

Sir,—There are two letters in your issue of September 25th with reference to the short communication of mine on the above subject which appeared in the Literary Notes of the Journal for September 11th.

In one of these Dr. C. H. Melland points out that Sir Lauder Brunton drew attention to the resemblance between the "fortification figures" sometimes seen as a migraine aura and Doré's illustrations to the *Divina Commedia* in the *Journal of Mental Science* for 1902. I had not seen this interesting article before, and am much obliged to Dr. Melland for calling my attention to it; but the resemblance, as he says, is certainly not so great as in Blake's drawings. I first noticed the likeness in February of 1901, when I mentioned it in a paper read before the Bristol Scientific Club.

The other letter in your Journal, by Mr. H. Elliot-Blake, does not carry any very definite meaning to my mind, owing partly, perhaps, to my ignorance of abstruse psychological terms; but I gather from such expressions as "meddling explanatory critics" that he resents my observations as an attempt to depreciate Blake's genius, which was certainly not my intention. He refers to my "attempt to perpetuate the popular fallacy of a wrongly disordered eccentricity to William Blake," who, he says, was "happily clear of the absolute sanity and decaying day-issues of business clippings," whatever that may mean. He also speaks of my "very strained coincidence"; but I venture to think that a further examination of Blake's drawings will convince him that "the coincidence" is very striking. I have a great admiration for much of Blake's work, and do not consider that my suggestion of a possible explanation of these weird zigzag lines need be considered a depreciation. As it is by no means unusual to get these "teichoptic" premonitions *without* the headache, the absence of evidence that William Blake suffered from migraine is, as Dr. Melland says, of no great import.—I am, etc,

Clifton, Sept. 27th. G. Munro Smith.

During the academic year 1908-9 the total number of students registered in the seventeen medical faculties of Italy was 4,387. They were distributed as follows: Naples, 1,437; Rome, 454; Turin, 381; Bologna, 307; Pavia, 290; Padua, 220; Palermo, 200; Genoa, 172; Florence, 155; Catania, 151; Siena, 50; Sassari, 42; the rest being scattered about the smaller schools.

The Services.

HEALTH OF THE NAVY.[1]

The *Statistical Report of the Health of the Navy for the Year 1908* was issued on September 21st. Attention is called to a new feature in the report: What previously appeared as the Home Station has this year been divided into the Home Station and the Home Fleet. No comparisons with the preceding five years could therefore be made.

Summary of Returns for Total Force.

The returns for the total force for the year 1908 show a continuous improvement in the general health of the fleet as compared with the preceding five years. Not only are the case, invaliding, and death ratios for the year under review lower than the average ratios for the last five years, but the average loss of service for each person has dropped from 11.28 to 10.36 days. The final invaliding ratio, however, shows a small increase in comparison with the previous five years' average. The total force, corrected for time, in the year 1908, was 109,210, and the total number of cases of disease and injury entered on the sick list was 75,608, which gives a ratio of 692.31 per 1,000, being a decrease of 53.49 as compared with the average ratio of the preceding five years. The number of entries per man for disease and injury was: Home Station 0.78, Home Fleet 0.64, Channel Fleet 0 61, Atlantic Fleet 0.6, Mediterranean 0.61, North America and West Indies with Fourth Cruiser Squadron 0.72, China 0 83, East Indies 1.09, Australia 0 68, Cape of Good Hope 0.6, and the Irregular List 0.76. For the total force the average was 0.69, the same as in 1907. The average number of men sick daily was 3,093.81, giving a ratio of 28.32 per 1,000, a decrease of 2.58 in comparison with the previous five years. The total number of days' sickness on board and in hospital was 1,132,336, which represents an average loss of service of 10.36 days for each person—a decrease of 0.92 in comparison with the average for the preceding five years. The ratio per 1,000 of men sick daily on the various stations was: Home Station 34.72, Home Fleet 27.2, Channel Fleet 22.64, Atlantic Fleet 23.71, Mediterranean 24.6, North America and West Indies with Fourth Cruiser Squadron 25.52, China 29.04, East Indies 28.68, Australia 26.2, Cape of Good Hope 23.03, Irregular List 48.02. For the total force the ratio was 28.32. As was the case in the three preceding years, the Channel Fleet shows the lowest, and the Irregular List the highest, sick-rate.

Invalidings.

The total number invalided was 2,184,[2] which gives a ratio per 1,000 of 19.98, a decrease of 2.91 per 1,000 in comparison with the average ratio for the preceding five years. The total number of persons finally invalided was 1,889, of whom 57 were invalided after refusing operative treatment. The ratio per 1,000 of final invalids was 17.29, an increase of 0.83 per 1,000 as compared with the average for the previous five years. Of the 2,184 invalids, 2,025, giving a ratio of 18.54 per 1,000, were for disease, and 159, a ratio of 1.45 per 1,000, were for injury. In comparison with the average ratios of the previous five years, the ratio per 1,000 of force invalided has decreased in the Mediterranean from 31.99 to 16 25; in China, from 24.1 to 22.04; in Australia, from 18.56 to 16.14; Cape of Good Hope, from 24.47 to 14.03; Irregular List, from 16.44 to 15.78; and Atlantic Fleet, from 25.7 (three years' average) to 16.48. In three stations there have been increases—namely, Channel, from 13.99 (three years' average) to 18.84, and in the East Indies from 31.08 (five years' average) to 45.34.

Deaths.

The total number of deaths was 369, giving a ratio of 3.37 per 1,000, a decrease of 0.54 in comparison with the average ratio for the last five years. Of this number, 227, or 2.07 per 1,000, were due to disease, and 142, giving a ratio of 1.3 per 1,000, to injury. In comparison with the death-ratios of the preceding five years, the ratio per 1,000 decreased from 4.18 to 2.04 in the Mediterranean; from 4.5 to 2.29 in China; from 4.47 to 3.72 in Australia; from 4.0 to 0.87 at the Cape of Good Hope; from 2.89 (three years' average) to 2.12 in the Channel Fleet; from 3.27 (three years' average) to 2.01 in the Atlantic Fleet. In three stations there have been increases—namely, in the East Indies from 7.27 (five years' average) to 7.55; North America and West Indies with Fourth Cruiser Squadron from 2.9 (three years' average) to 3.83; and Irregular List from 3.89 (five years' average) to 4.78.

General Diseases.

The following is a summary of the returns under the head of general diseases:

Small-pox.—4 cases; 1 each from the Home Station, China, East Indies, and Irregular List.

Cow-pox.—233 cases, 163 of which were from the Home Station.

[1] London: Printed for His Majesty's Stationery Office by Eyre and Spottiswoode, Ltd., Printers to the King's Most Excellent Majesty. And to be purchased, either directly or through any bookseller, from Wyman and Sons, Ltd., Fetter Lane, E.C., and 32, Abingdon Street, Westminster, S.W.; or Oliver and Boyd, Tweeddale Court, Edinburgh; or E. Ponsonby, 116, Grafton Street, Dublin. (Price 8d.)

[2] This number includes men temporarily invalided from foreign stations, many of whom are again able to join the active force. The number finally invalided represents the waste of the service from this cause during the year.

Measles.—231 cases; 131 from the Home Station and 69 from the Home Fleet.

Scarlet Fever.—171 cases; 122 from Home Station, 17 from Home Fleet; 2 deaths.

Mumps.—177 cases; 108 from Home Station.

Influenza.—3,643 cases, with 1 final invaliding and 4 deaths. This gives a case ratio of 33.35 per 1,000, as compared with 21.09, the average of the preceding five years. The Home Station contributed 1,201 cases, the Home Fleet 1,062, and the Channel Fleet 879 cases.

Diphtheria.—75 cases, with 3 deaths; Home Station 60 cases, and Home Fleet 7. This gives a case ratio of 0.68 per 1,000, as compared with 0.32, the average ratio of the preceding five years.

Cerebro-spinal Fever.—2 cases, with 1 death; both from Home Fleet.

Enteric Fever.—151 cases, with 2 final invalidings and 20 deaths. The case, invaliding, and death ratios per 1,000 were 1.38, 0.01, and 0.18 respectively, as compared with 1.82, 0.01, and 0.27, the average ratios of the preceding five years. The Home Station returned 31 cases; Home Fleet, 36; Channel Fleet, 21; Atlantic Fleet, 11; Mediterranean, 18; North America and West Indies, with Fourth Cruiser Squadron, 15; China, 10; East Indies, 4; Australia, 2; and Irregular list, 3.

Malta Fever.—9 cases; 3 from Channel Fleet and 6 from Mediterranean. The case, invaliding, and death ratios per 1,000 were 0.08, 0.01, and nil respectively, as compared with 2.66, 0.13, and 0.05, the average ratios of the preceding five years. The number of days lost to the service was 1,000; five years ago (1903) it was 30,541.

Pyrexia.—419 cases. The Mediterranean contributed 119; China, 107; and East Indies, 109. The case ratio per 1,000 was 3.83, as compared with 6.69, the average ratio of the preceding five years.

Cholera.—1 case from China.

Dysentery.—32 cases, with 3 final invalidings, and no deaths. China furnished 15, and the other stations from 1 to 4 each, excepting the Channel Fleet, which had no case.

Pneumonia.—506 cases, with 7 final invalidings, and 47 deaths. The case, invaliding, and death ratios per 1,000 were 4.72, 0.06, and 0.43 respectively, as compared with 4.37, 0.09, and 0.36, the average ratios of the preceding five years. The Home Station furnished 180 cases; the Home Fleet, 136; Channel Fleet, 78; Atlantic Fleet, 33; Mediterranean, 27; North America and West Indies with Fourth Cruiser Squadron, 24; China, 14; Australia, 12; Irregular List, 8; East Indies, 3; and the Cape of Good Hope, 1.

Malaria.—764 cases with 28 invalidings from foreign stations, and 1 final invaliding from the service; there were 3 deaths. The case, invaliding, and death ratios per 1,000 were 6.99, less than 0.01, and 0.02 respectively, as compared with 5.63, 0.01, and 0.02, the average ratios of the preceding five years. The year 1908 was a bad one for malarial diseases in the East Indies, where 435 cases occurred, representing a case ratio per 1,000 of 252.9; the next highest case ratio was the Irregular List, with 23.44; the third, China, with 13.93. The total number of cases (764) does not imply that that number of men was affected, as some men had as many as four and five relapses.

Septic Diseases.—40 cases; 35 of erysipelas, with 3 deaths; 1 pyaemia, with 1 death; and 4 septicaemia, with 3 deaths. The case and death ratios per 1,000 were 0.36 and 0.06 respectively, in comparison with 0.36 and 0.07, the average ratios of the preceding five years. The Home Station furnished 18 cases, and the Home Fleet 11.

Tuberculosis.—337 cases, with 268 final invalidings and 37 deaths. The case, invaliding, and death ratios per 1,000 were 3.08, 2.45, and 0.33 respectively, as compared with 3.41, 2.5, and 0.42, the average ratios of the preceding five years. Of the total number, pulmonary tuberculosis contributed 286 cases, with 31 deaths; disease of testis, 16; joints, 9, with 1 death; glands, 7; meningitis, 3, with 3 deaths; peritoneum and kidney, 3 each; bladder, ulcer (*sic*), and spine, 2 each; bone and rectum, 1 each; and general tuberculosis, 2, with 2 deaths. The Mediterranean contributed the highest case ratio, and the Channel Fleet the lowest.

Venereal Diseases.—The total number of cases recorded is 13,379—namely, chancroid, 1,952; syphilis (primary), 1,037; syphilis (secondary), 3,055; gonorrhoea and sequelae, 7,335. The final invalidings were: Syphilis (secondary), 89; gonorrhoea and sequelae, 40. The six deaths were all due to secondary syphilis. The case ratio shows an increase per 1,000 of 2.46. The total number of days' loss of service was 325,432, while the average daily number of men ineffective from these diseases was 889.15, as compared with 903.9 in 1907. Australia shows the highest case ratio per 1,000 with 153.08, closely followed by the Home Station with 152.77; the Channel Fleet, with a ratio of 79.7, is by far the lowest.

Rheumatic Fever.—712 cases, with 81 final invalidings and 1 death. The case-ratio shows an increase of 3.83 per 1,000, but this disease and muscular rheumatism were formerly classed as one. Of the total (712) the Home Station contributed 339 cases and the Home Fleet 124.

Other Infective Diseases.—11 cases, which include 4 from beri-beri, with 3 deaths; 1 of typhus fever; 4 of whooping-cough; and 2 of osteo-myelitis, with 1 death; and 2 deaths from endocarditis.

Parasitic Diseases.—3,878 cases, of which scabies represented 3,780. The Home Station contributed 1,672 of the latter; Home Fleet, 1,079; Channel Fleet, 556.

Poisons.—115 cases with 2 final invalidings and 4 deaths; ptomaine poisoning gave 70 cases, and lead 16. Under this head it is stated that 2 deaths occurred during the administration of anaesthetics; 1 death was due to opium and 1 to mercury.

Alcoholism.—113 cases with 2 invalidings and 2 deaths.

New Growths.—171 cases of "non-malignant," and 9 of "malignant;" of the latter, 2 died.

Local Diseases.

The following is a summary of the diseases under the heading of "local diseases."

Diseases of the Nervous System.—862 cases, with 266 final invalidings and 10 deaths. The case, invaliding, and death ratios per 1,000 were 7.89, 2.43, and 0.09 respectively, in comparison with 8.84, 2.45, and 0.15, the average ratios of the preceding five years. "Nervous diseases" accounted for 803 cases, with 200 invalidings, and mental diseases accounted for 59, with 66 invalidings.

Diseases of the Eye.—797 cases with 157 final invalidings.

Other Organs of Special Sense.—614 cases with 128 final invalidings and 1 death. Ear diseases accounted for 548 cases and 117 final invalidings and the one death.

Diseases of the Circulatory System.—610 cases. Organic heart disease accounted for 205 cases, functional heart disease for 158, aneurysm for 16, diseases of veins for 218, other diseases included under this system for 13; 201 cases were finally invalided, of which 151 were for organic heart disease and 21 for functional disease. There were 28 deaths, namely, 10 from organic heart disease, 7 from aneurysm, and 1 from other diseases under this system. The case ratio showed a slight decrease in comparison with the average ratio of the last five years.

Diseases of the Respiratory System.—8,143 cases with 57 final invalidings and 14 deaths. The case ratio, which last year showed a decrease per 1,000 of 16.08 on the previous five years, this year shows a decrease of 1.03 only. "Catarrh" furnished 6,920 of the cases under this heading.

Diseases of the Digestive System.—11,166 cases with 277 final invalidings and 26 deaths, giving a case, invaliding, and death ratios per 1.000 of 102.24, 2 53 and 0.23 respectively as compared with 112.04, 1.94 and 0.22, the average of the preceding five years. "Mouth and teeth" diseases accounted for 862 cases; sore throat for 2,119; tonsillitis for 3,169; diseases of the stomach and intestines for 3,858; and hernia for 612, 24 of which were invalided after refusing operative treatment; haemorrhoids for 351; hepatitis for 71; and other diseases for 124. The highest case ratios were furnished by the East Indies, and the lowest by the Cape of Good Hope.

Diseases of the Lymphatic and Glandular System.—475 cases with 6 final invalidings.

Diseases of the Urinary and Generative Systems.—886 with 66 final invalidings and 10 deaths. Diseases of the kidneys accounted for 8 deaths, and stricture of urethra for 2 deaths.

Diseases of the Organs of Locomotion.—1,811 cases, with 66 final invalidings and 1 death. Diseases of the joints furnished 11 final invalidings.

Diseases of the Connective Tissue and Skin.—8,996 cases, with 1 death from angina Ludovici in the Mediterranean. The case ratio varied from 184.3 in the East Indies to 64.27 in the Home Station.

Injuries.

A. General.—234 cases, with 1 final invaliding and 115 deaths. The case ratio per 1,000 shows a decrease of 0.69, and the death ratio an increase of 0.12, as compared with the average ratio for the last five years. The deaths were due to: Burns and scalds, 4; heat-stroke, 1; multiple injury, 11; suffocation from submersion, 98; and 1 case unclassed, namely, that of the disappearance of an officer while shooting on the West Coast of Africa. He had landed with another officer to shoot game; subsequently they separated. He was never seen again. The theory that found most acceptance was that an elephant had attacked him, and pressed him below the surface of the swamp. Two cases of caisson disease were recorded.

B. Local.—15,421 cases with 133 final invalidings and 15 deaths, giving a case, invaliding, and death-ratio per 1.000 of 141.2, 1.21, and 0.13 respectively, in comparison with 152.96, 1.16, and 0.16, the average ratios for the last five years. The East Indies Station returns 2 "wounds in action," both of which proved fatal. The cases occurred in the *Proserpine* when it was patrolling the Makraan coast for arms-running dhows about thirty miles north of Jashk.

Suicide.

Ten deaths under this heading are returned. This gives a ratio per 1,000 of 0.09, which is a decrease of 0.03 in comparison with the average ratio for the five preceding years.

On September 25th the new infirmary and extended workhouse provided by the City of London guardians at Homerton was formally opened. The new buildings are the outcome of a scheme which has been before the City guardians for some time, for reducing their Poor Law expenditure by giving up their present institution at Bow and concentrating all their work at Homerton. The practical result is that the guardians find themselves with a workhouse and infirmary sufficient for all their purposes designed and equipped for 681 indoor inmates and 63 officers. The cost has been between £50,000 and £60,000, while £3,300 has been expended on the provision of a lunatic block.

Public Health AND POOR LAW MEDICAL SERVICES.

MEDICAL MEN AS MEMBERS OF COUNTY COUNCILS AND URBAN DISTRICT COUNCILS.

WE have received a communication relative to a reply to a query which appeared under this heading in the JOURNAL of September 18th, p. 826. We may point out that fees for notification of infectious diseases are not "earned" in the ordinary sense of that term; they are not paid for voluntary services, but occasionally automatically accrue by special legislation to members of urban and other councils.

DUTIES OF MEDICAL OFFICERS OF HEALTH AND SCHOOL MEDICAL OFFICERS.

H. M. H.—The duties of a medical officer of health are set out in the Order of the Local Government Board dated March 23rd, 1891. In December of each year it is the custom for the medical officer of the Local Government Board to send to every medical officer of health a communication concerning the annual report of the latter. This communication is actually a memorandum on the duties of the medical officer of health. For an account of the powers and duties of a school medical officer the following circulars of the Board of Education should be consulted: 576, price 2d.; 582, price 1d.; 596, price 1d.

FEES FOR CERTIFICATION OF WORKHOUSE LUNATICS.

H. W. S., a workhouse medical officer, writes saying he is surprised to learn that our former correspondent, "G. W." (to whose inquiry an answer appeared in the BRITISH MEDICAL JOURNAL of September 18th, p. 826), has received even 10s. 6d. per case for his lunacy certificates. He (H. W. S.) says: "When the Act, 1890, came into operation he was informed by the relieving officer that in future no fee was payable, and since then he has received none." H. W. S. asks our opinion as to his own claim for certifying workhouse lunacy cases.

*** We are afraid our correspondent has been misled as to the fees for certifying workhouse lunatics. These are of two classes: (1) Those certified as being fit to be detained in the workhouse; (2) those certified for removal to asylum. For certifying the first of these the medical officer of the workhouse does not appear to be entitled to any fee; for certifying those sent to an asylum the medical officer of a workhouse (when called upon to certify) is by Clause 285 of the Lunacy Act, 1890, clearly entitled to reasonable remuneration for his certification, and we still believe that a guinea is generally paid as such.

CERTIFICATION FOR TEMPORARY DETENTION OF ALLEGED LUNATICS IN WORKHOUSES.

R. B. A. writes as follows: (1) An alleged lunatic is brought to a workhouse by a relieving officer under Sec. 20, 1890. A doctor and justice see the lunatic but cannot agree as to the insanity of the patient. If the medical officer of the workhouse sees that the patient is insane, must he detain the patient for fourteen days under Sec. 24 without any further reference to the justice? or can the justice order the detention of an inmate in the workhouse who is already an inmate for further observation? (2) When a relieving officer gives notice to a justice that a lunatic resides at a certain place, does his responsibility cease, or is the relieving officer responsible for the safe custody of the alleged lunatic until the justice orders the patient's removal?

*** (1) By the provisions of Section 24 of the Lunacy Act, 1890, the medical officer of a workhouse can certify that a person is a proper subject for detention in a workhouse for a period not exceeding fourteen days, a step often taken to secure that an alleged lunatic shall be under observation. The medical officer can take this step where a justice has declined to make an order in the case of an alleged lunatic brought to the workhouse by a relieving officer under Section 20 of the Act, 1890. This does not empower the justice to make an order for the detention of an inmate for fourteen days' observation; that can only be done by the medical officer of the workhouse. (2) The relieving officer can remove the alleged lunatic to the workhouse for a period not exceeding three days pending the order of the justice for his removal to an asylum; if there be no accommodation in the workhouse, and the persons in the house of the alleged lunatic be unable to control him, the guardians might be asked to provide such assistance as may be necessary for his safe keeping in the interval.

Medico-Legal.

FIFE COLLIERY MEDICAL MAN'S FEES.

DECISION was given in the Sheriff Court at Dunfermline on September 23rd in a test case arising out of a dispute between the Fife and Kinross Miners' Association and the Fife and Clackmannan Coalowners' Association. The action was decided upon at a debate between the respective agents for the parties concerned. David Adam, miner, Kelty, President of the Fife and Kinross Miners' Association, sued the Fife Coal Company for 1s. 6d. in respect of deductions which had been made from his pay for three fortnights for doctor's fees. There had been a change of doctor, and the pursuer claimed that he was not entitled to pay for the dues which the defenders were collecting on behalf of a certain medical man. The Truck Acts were pleaded on behalf of the pursuer, but it was contended for the defenders that the provisions of these statutes did not apply to the case. In absolving the defenders, with 10s. of expenses, the Sheriff said that the pursuer signed his pay lines, which embodied an authorization to deduct "from my wages in future, so long as I am in your employment, the amount of my house rent, also the sums paid by you for medicine and medical attendance." On July 13th and 27th and August 10th pursuer signed pay lines containing the above authorization, and on each occasion he accepted without question a balance of wages from which 6d. had been deducted for "doctor." These were the three sums of 6d. each now sued for. Prima facie, the pursuer was barred by the terms of his own receipts. The pursuer's answer was that this authority to deduct only held good for things actually supplied.

COMPENSATION CLAIMS.

T. B. R. writes that a club secretary, calling at his house to pay him his quarterly fees, on leaving his house, instead of returning by the ordinary path, took a short cut over a sloping bank of the terrace, stumbled and fell, fracturing his tibia. As a club member, our correspondent attended him for the injury, and he has now received a letter from his patient's solicitor, asking what compensation he proposes to pay for the accident on account of the dangerous condition of his premises. What course ought he to take?

*** Our correspondent has only one course to take, and that is to repudiate the claim, and to put the matter into the hands of his solicitor should it be persisted in.

J. I. M. asks if a debt collector, who works for him and for other medical men in his neighbourhood, and is also an insurance agent and rent collector, can claim on him for an accident incurred while collecting his accounts under the Workmen's Compensation Acts.

*** If the collector were regularly employed by our correspondent, and the accident occurred while in such employment only, it is to be presumed he might claim compensation, and it would be wise to insure against the contingency.

FEES TO MEDICAL WITNESSES.

"INQUIRER" received a summons to attend the police court with a guinea fee, which he understood to be "conduct money." He wrote to the solicitor, sending him the guinea, that he should refuse to give evidence on attending, unless another guinea were paid him. In court he at first refused to give his evidence, but on threat of detention, finally gave way. He would like to know: (1) Was the case a criminal or civil one? (2) Was he entitled to more than a guinea? If the money paid was "conduct money," as he contended, he has received nothing for his attendance. (3) In the case of a police subpoena, should "conduct money" be given at the time and are travelling expenses allowed? (4) Is there a time limit legally between the serving of a subpoena and the appearance in court?

*** (1) Clearly a criminal case. (2) "Conduct money" simply means the money necessary to defray the expenses of the witness in travelling to the court, and might be more or less than a guinea, according to distance. The usual fee for giving evidence at a police court is half a guinea. (3) "Conduct money" should be given and implies reasonable travelling expenses. (4) There is no time limit, but a "reasonable" time must be allowed the witness to travel to the court.

PROFESSIONAL INFORMATION TO CORONERS.

W. F. L. D. writes that he was requested by a police officer to travel five miles to view the body of a man found dead on the roadside. The officer showed him a telegram from the coroner instructing him to apply to a doctor to go and view the body and report to the coroner the same evening. This request was complied with and the opinion given in writing that there were no external appearances to indicate the cause of death. No inquest was subsequently held. Our

correspondent asks what fee (if any) he is entitled to and to whom he is to apply for it.

*** We fear that our correspondent will not be able to establish his *legal* right to a fee in the circumstances. We believe it is not usual for the police to pay fees for professional services rendered in roadside cases, and as no inquest was held, the coroner would have to pay the fee (if any) out of his own pocket, and it is hardly likely he would be prepared to do this. We therefore suggest that our correspondent should courteously draw the attention of the coroner to the strong moral claim he has to some remuneration for his professional services. We may add that we think the coroner might at least have written a special letter of thanks for assistance so readily asked for and not less readily rendered.

Medico-Ethical.

The advice given in this column for the assistance of members is based on medico-ethical principles generally recognized by the profession, but must not be taken as representing direct findings of the Central Ethical Committee.

HEALTH LECTURES AND ADVERTISING.

D. C.—A public vaccinator, or any other member of the medical profession possessed of adequate knowledge, is only performing a duty to the public and to the profession by taking advantage of an opportunity to explain to a popular audience the aims and purpose of vaccination; and no exception ought to be taken to the publication of the title of the lecture on the syllabus of the society under whose auspices it is to be given, or on the large poster version of the syllabus which is placed outside the hall.

SUPERSESSION BY A CONSULTANT.

Ethics complains that he was asked to meet B., a general practitioner, in consultation on a case under his care, and in due course this consultation took place. The following day B. called again upon the patient, after intimating to our correspondent his intention to do so. Four days later the patient asked our correspondent to meet B. again. He did so, but before seeing the patient expressed his objection to B.'s action in calling the day after the consultation without being requested to do so. B. said he was requested by the patient. Our correspondent replied that he ought to have been told of this by both B. and the patient; consequently he declined further attendance. We are asked to say whether B. was guilty of a breach of ethics by calling the day after the consultation, and again by taking over the case having been called to it as a consultant, and whether A., in the circumstances mentioned, could have done anything but decline further attendance without loss of dignity?

*** B. was guilty of a breach of ethical rules in visiting the patient by himself, and the fact that he was asked to do so by the patient is immaterial, but as he intimated his intention to visit her at a certain time he gave our correspondent an opportunity to be present, or to demur to the arrangement. A. need not have declined further attendance; he should have insisted that B. should pay no further visits except in consultation with him, and at times mutually arranged between them.

Universities and Colleges.

UNIVERSITY OF LONDON.

St. George's Hospital.

Lectures on Public Health.

A course of six lectures on public health will be given in the Medical School of St. George's Hospital by Mr. F. E. Fremantle, Edward Jenner Lecturer on Public Health at St. George's Hospital, on Tuesdays, November 2nd, 9th, 16th, 23rd, 30th, and December 7th, at 4 o'clock. The following subjects will be discussed: (1) The Declining Birth-rate, (2) Vital Statistics, (3) Infant Health, (4) School Health, (5) Isolation Hospital, (6) Housing and Town Planning. The lectures are open to those interested in public health, a fee of half a guinea being charged for the course. Application for tickets of admission should be made to Mr. S. A. Williamson, Clerk to the Dean, St. George's Hospital Medical School, S.W.

The last quinquennial census of medical practitioners in France shows that in 1906 there were 18,211 doctors of medicine and 928 *officiers de santé*. In 1876 there were 19,743 doctors and 6,633 *officiers de santé*. The latter diploma was abolished in 1892. Between 1898 and 1907 the average number of persons on whom the degree of doctor of medicine was conferred annually by the French faculties was 1,100. I 1908 the number fell to 966.

Obituary.

HUBERT ELWYN JONES BISS, M.A., M.D.Cantab., D.P.H.

Dr. Hubert Biss, second son of Dr. C. Y. Biss, Physician to the Middlesex and Brompton Hospitals, died at Eastbourne on September 20th, at the age of 37.

He had, during the last year, suffered much pain, and, though it had been hoped that rest and treatment would restore his health, grave haemorrhage occurred shortly after he, under advice, entered a nursing home only a week or two ago.

In spite of the assiduous care of Dr. Harper and other friends his condition became rapidly worse, and, when after some days of unconsciousness the end came, he was laid to rest at Ocklynge Cemetery on September 25th.

Biss was educated for the medical profession at King's College, Cambridge, and the Middlesex Hospital. He held the diplomas of M.R.C.S., L.R.C.P.Lond., and the degrees of M.A. and M.D.Camb. After holding office in 1897 as House Physician at the Brompton Hospital for Consumption, he was chosen to be in immediate medical attendance on the late Mr. Gladstone, with whom he resided for some months before his death at Hawarden in 1898.

The marks of esteem and confidence that Dr. Biss received then, and throughout the remainder of his career, from the family of his illustrious patient, sufficiently prove how well and wisely he justified the trust reposed in him. Subsequently Biss became an Assistant Medical Officer in the hospitals of the Metropolitan Asylums Board; obtained at Edinburgh a diploma in public health, and paid much attention to epidemiology and allied subjects.

Amongst other valuable papers written by him at this time one on The Borderlands of Scarlet Fever and Diphtheria deserves permanent recognition as a really masterly contribution to the elucidation of a difficult subject. On his marriage in 1903 Hubert Biss settled for a while at Eastbourne, but returned to London, attracted by opportunity for continuing his literary work as assistant editor of one of the medical journals, and at the same time engaging in assurance and other work.

Here his reputation and practice rapidly extended; his success seemed certain and secure; and, even when it was made clear to him that rest was necessary, he was full of plans and hopefulness for the future, while to the very last fresh demands on his time and abilities were being pressed on him. He had found work in which he delighted, and his peculiar abilities served him in such good stead, in court and elsewhere, that a desire, if not an intention, of being called to the Bar had already been formed. This and other things were, however, not to be.

Dr. Hubert Biss was a man who will not soon be forgotten by those who really knew him. He possessed unusual capacity, and had read and thought much.

His keen literary sense and humorous appreciation, his wide sympathies and his charm of manner made him to his friends the most delightful of companions. And the epithet of "freehearted," applied by a ballad writer whose MS. may be found in the Pepysian collection, to a Biss of the early seventeenth century—a once popular but now forgotten hero—rises in the mind with peculiar insistence. He has left a widow and a little son.

Deaths in the Profession Abroad.—Among the members of the medical profession in foreign countries who have recently died are Dr. Hermann Lossen, Honorary Professor of Surgery in the University of Heidelberg, aged 66; Dr. Santi Sirena, Professor of Pathological Anatomy in the University of Palermo; Dr. Antonio Curci, Professor of Materia Medica and Pharmacology in the University of Catania; Dr. L. Hendrix, a pioneer of paediatrics in Belgium, and one of the founders of policlinics in that country; Dr. Alfons Edler von Rosthorn, Professor of Obstetrics and Gynaecology, first at Graz, then at Heidelberg, finally at Vienna, aged 52; Dr. Agnes Hacker, a well-known medical woman who practised as a surgeon in Berlin, aged 49; Dr. E. C. Hansen, Professor of Anatomy in the University of Copenhagen; Professor Max Eduard Jaffé, Surgical Director of the Jewish Municipal Hospital at Posen, aged 51; and Dr. R. Boddaert, some time Professor of Pathological Anatomy in the University of Ghent, aged 75.

Letters, Notes, and Answers.

BRITISH MEDICAL ASSOCIATION AND BRITISH MEDICAL JOURNAL.

The offices of the British Medical Association and of the British Medical Journal are at 429, Strand, London.

Communications respecting Editorial matters should be addressed to the Editor, 429, Strand, London, W.C.; those concerning business matters, advertisements, non-delivery of the Journal, etc., should be addressed to the Office, 429, Strand, London, W.C.

Telegraphic Address.—The telegraphic address of the EDITOR of the British Medical Journal is *Aitiology, London.* The telegraphic address of the British Medical Journal is *Articulate, London.*

Telephone (National):—
2631, Gerrard, EDITOR, BRITISH MEDICAL JOURNAL.
2630, Gerrard, BRITISH MEDICAL ASSOCIATION.
2634, Gerrard, MEDICAL SECRETARY.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* British Medical Journal *alone unless the contrary be stated.*

Authors desiring reprints of their articles published in the British Medical Journal are requested to communicate with the Office, 429, Strand, W.C., on receipt of proof.

Correspondents who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

Correspondents not answered are requested to look at the Notices to Correspondents of the following week.

Manuscripts forwarded to the Office of this Journal cannot under any Circumstances be Returned.

In order to avoid delay, it is particularly requested that ALL letters on the editorial business of the Journal be addressed to the Editor at the Office of the Journal, and not at his private house.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* British Medical Journal *are devoted will be found under their respective headings.*

QUERIES.

Locomotor asks if there is any home where Frenkel's treatment for tabetic ataxia is carried out in Great Britain, and if there is, what the fees are.

Mersey asks for details of the construction and use of the lamp-trap for mosquitos, and if it would be of any use for gnats and mosquitos found in England.

Keloid writes: Will any member kindly give his experiences after using fibrolysin or iodolysin for keloid scars, such as those occurring after suppurating glands in the neck?

Perplexed invites suggestions for the treatment of two cases of chronic insomnia of two and three years' standing. *Enormous* doses of all the usual hypnotics are tolerated and required to produce *any* sleep. Withholding of hypnotics results in mental and physical collapse. Baths and wet packs give no results. The writer has tried hypnotic suggestion with no success. There are no worries in either case.

Continuous Neuralgia.

Seventy-two writes: Can any member suggest a remedy for intense and continuous neuralgia following shingles? I have an old lady patient for whom I have run over the whole gamut of drugs and been obliged to fall back on morphine. One shoulder and arm are affected, and the pain has lasted over six months.

ANSWERS.

Diagnosis of Diphtheria.

J. G.—On the information given it is not possible to state the probable cause of the epidemic. Can the correspondent obtain any information as to the incidence of the disease amongst those customers of the dairy who boiled the milk before drinking it and those who did not? That 2 cases out of 12 occurred amongst non-consumers of the suspected milk is against the milk as a source of infection, unless the 2 cases caught the disease from some of the other cases. Manure has been suspected of harbouring the organism of diphtheria, but definite proof that it has really done so is wanting. But it does not seem to be desirable to have a manure dépôt in the middle of the byres. The age-incidence is certainly unusual and points to the activity of the cause of the disease being limited to adults.

LETTERS, NOTES, ETC.

Methods of Quackery.

Dr. James W. Kidd, of Fort Wayne, Indiana, U.S.A., who last April was offering to give the people in this country who had previously applied to him for treatment "the chance of a lifetime to be restored to perfect health" for 10s., has recently repeated his offer to a correspondent at the reduced price of 6s., as he states that he is "determined to have a cured patient in your vicinity within the next two months." The treatment consists of a series of tablets, and the result of their analysis will be found in the Journal of March 13th, 1909, p. 671. The chief ingredients of these tablets appear to be sodium carbonate, gentian, sodium benzoates, oil of wintergreen, and aloes.

Weak Ankle.

Dr. F. Butcher (Medical Officer, Fife and Kinross Asylum) writes: "C. E. W." (p. 580) will find his patient benefited by wearing a strong laced boot in which the stiffening ordinarily inserted over the heel has been carried up above the ankle. Some little moulding or cutting may be required over the external malleolus, but an intelligent shoemaker will easily arrange that. I have found this boot quite satisfactory in the case of a very stout elderly patient who sustained a severe sprain some months ago.

Railway Passengers' Assurance Company.

We are asked to state that the Railway Passengers' Assurance Company, which has been housed at 64, Cornhill, for the past half-century, has determined (in co-operation with the Union Bank of Scotland) to rebuild its premises, which will in future comprise 61, 62, 63, and 64, Cornhill, 124 and 126, Bishopsgate Street, and 1, White Lion Court. During the rebuilding, which will commence at once, the company's address will be 81, Cornhill, E.C.

Jelly for the Examination of Leucocytes in the Blood.

Messrs. Evans Sons, Lescher and Webb, Limited (Liverpool) write: Our attention has been drawn to an article in your issue of August 28th by Dr. Charles J. Macalister, "Observations Concerning the Blood in Chorea and Rheumatism." We notice mention made in this article of certain jellies recommended by Dr. H. C. Ross for the examination of leucocytes in the blood. It may be of use to some readers of the British Medical Journal to state that at the request of Dr. Ross we are making these jellies, and are, therefore, able to supply them to any interested in the matter.

Vulvar Tumour.

Dr. Joseph Scott (Teheran, Persia) writes: A short time ago a Persian woman presented herself at the hospital with a vulvar hypertrophy. The history was unimportant. The tumour was fully 5 in. long, presented the appearance and colour of integument, firm, leathery, and not at all sensitive; it had an irregular and nodulated contour. The circumference of the tumour at its most dependent part was 4½ in.; it involved the prepuce of the clitoris and most of the right nympha. The affected parts were thoroughly removed, the patient making a good recovery.

Asthma and Diphtheria Antitoxin Serum.

With reference to a note on this subject which appeared in the Journal of July 30th, Dr. J. Aikman, of Guernsey, has drawn our attention to a letter from him which appeared in the *Lancet* some years ago. In this he pointed out that it was doubtful whether some vaccines, serums, and antitoxins were really as specific or individual in their character as they were supposed to be, and suggested that their influence and possible utility was not limited to diseases for the cure and prevention of which they were originally put forward. Perhaps they really contained a specific body of some character, but possibly their effect was due to a by-product—a nuclein derivative—in the serum. In any case, he had found antidiphtheritic serum of decided utility in dealing with boils and in septic conditions in young children. Since then he has had corresponding experience in the treatment of asthma. His attention to the utility of antidiphtheria serum in this disease was drawn by an old asthmatic to whom, having been in contact with some diphtheria cases, he had given a small prophylactic dose. The old asthmatic found his asthma benefited and asked for the same treatment to be continued but with his asthma as the point of attack. He had given similar doses to other asthmatics and found most cases relieved thereby. He has been chary of publishing results, he says, since asthma is such a tricky disease, and for his knowledge of ultimate results he usually has to depend on patients' letters, because his patients seldom remain permanently in Guernsey. Of such letters he has forwarded several for examination, and they certainly suggest that the benefit received is of marked and enduring character. The dose which Dr. Aikman has found valuable is 1,000 units, repeated at intervals. He tried larger doses in his first case, but found that it increased the expectoration to an uncomfortable degree. He would advise the use of antidiphtheria serum in any asthma case in which the condition of the heart was such that a mild bronchitis, if any should occur, would not be likely to give material trouble.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Eight lines and under	0	4	0
Each additional line	0	0	6
A whole column	2	13	4
A page	8	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Wednesday morning preceding publication: and, if not paid for at the time, should be accompanied by a reference.

Note.—It is against the rules of the Post Office to receive *Poste Restante* letters addressed either in initials or numbers.